

#### **BOSTON REGION METROPOLITAN PLANNING ORGANIZATION**

Monica Tibbits-Nutt, MPO Chair | Secretary and CEO, Massachusetts Department of Transportation
Tegin Leigh Teich, Executive Director, MPO Staff

### TECHNICAL MEMORANDUM

DATE: October 7, 2024

TO: Jen Klein, Friends of the Blue Hills

Allison Ruel, City of Quincy

FROM: Casey Cooper, Boston Region Metropolitan Planning Organization RE: Skyline Trail Crossing of Route 28 in the Blue Hills Reservation

#### **EXECUTIVE SUMMARY**

The Skyline Trail is a popular hiking route within the Blue Hills Reservation. People traveling along the Skyline Trail enjoy nature and scenic views for much of their outing, but motor vehicles traveling along Route 28 introduce a conflict point along the path. The trail's Route 28 crossing is located near the crest of a hill and along a curve, making it difficult for people driving and people hiking to see one another. The Friends of the Blue Hills and the City of Quincy reached out to Boston Region Metropolitan Planning Organization (MPO) staff to improve the safety of the Skyline Trail crossing of Route 28.

MPO staff analyzed vehicle volumes and vehicle speeds both north and south of the Skyline Trail on Route 28 and studied pedestrian volumes at the Skyline Trail entrances on both sides of Route 28. Vehicle volumes were lowest on Route 28 on weekends, when vehicle speeds were fastest, while the Skyline Trail experienced the greatest level of use on weekends. MPO staff propose modifications to the current Route 28 crossing location to encourage safety, especially on weekends when high vehicle speeds are coupled with high pedestrian volumes.

The Skyline Trail crossing of Route 28 is currently unmarked by a crosswalk. The only notice provided to motorists regarding the presence of the crossing are two signs facing oncoming traffic on either side of the Skyline Trail. MPO staff recommend adding crosswalk markings across Route 28 to increase driver awareness of the Skyline Trail's presence. Staff also propose raising the roadway at the crossing to slow the speeds at which people drive through the location. MPO staff also suggest adding pedestrian bump outs to narrow the roadway and improve crossing visibility for both drivers and trail users. These changes should be accompanied by increased signage about the crossing to raise awareness. Finally, the addition of rectangular rapid flashing beacons to

Civil Rights, nondiscrimination, and accessibility information is on the last page.

each side of the Skyline Trail crossing would allow hikers to alert drivers to their presence.

#### 1 BACKGROUND

This memorandum reports the findings of a transportation study of the location where the Blue Hills Reservation's Skyline Trail crosses Route 28 in Quincy, Massachusetts. The study was conducted through the Community Transportation Technical Assistance (CTTA) Program administered by staff to the Boston Region MPO. The CTTA Program provides technical analysis and support to municipal officials about local transportation issues in the Boston metropolitan region.

The Friends of the Blue Hills and the City of Quincy contacted MPO staff regarding the safety of Route 28's Skyline Trail pedestrian crossing. The organization and the City requested that MPO staff study conditions for trail users where the Skyline Trail crosses Route 28. Both entities expressed interest in installing pedestrian signals at the location because it is one of the most used roadway crossings in the Blue Hills Reservation. Figure 1 illustrates the location of the Skyline Trail within the Blue Hills Reservation and identifies where the trail crosses Route 28 in Quincy. This study identified improvements that would facilitate a safer and more comfortable Route 28 crossing for people traveling along the Skyline Trail.

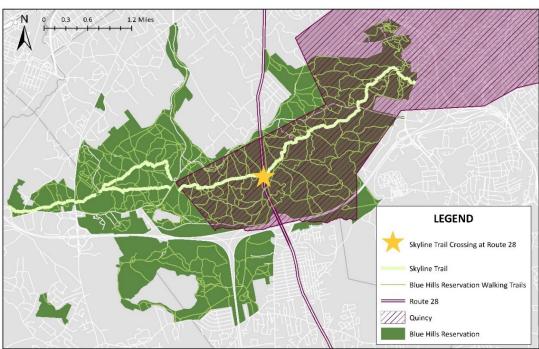


Figure 1
Skyline Trail Crossing of Route 28 in the Blue Hills Reservation

This study location includes multiple jurisdictions. The crossing itself is within the City of Quincy, but Route 28 is the jurisdiction of the Massachusetts Department of Transportation (MassDOT). Quincy is served by MassDOT District 6. The Blue Hills Reservation is the responsibility of the Department of Conservation and Recreation (DCR). A kick-off meeting held on August 4, 2022, convened these stakeholders and the Friends of the Blue Hills to discuss the existing conditions, issues, and concerns at the study location.

#### 2 EXISTING CONDITIONS

The Skyline Trail is a 7.5-mile route that covers the length of the Blue Hills Reservation, stretching from its eastern end to the conservation area's western bounds. The trail climbs many of the Blue Hills Reservation's peaks and is known for providing beautiful views, which contribute to the Skyline Trail's popularity as a hiking route within the Blue Hills Reservation. The trail's intersection with Route 28 introduces a stressful contrast to the natural environment that hikers experience along the majority of the Skyline Trail's path.

Route 28 is a principal arterial roadway that travels in a north-south direction through the Blue Hills Reservation, bisecting the conservation area. Two buses travel along Route 28, the Massachusetts Bay Transportation Authority (MBTA) Bus 240 and Brockton Area Transit Authority Bus 12, but neither stops in the Blue Hills Reservation. Where the two-lane roadway meets the Skyline Trail, the asphalt measures approximately 40 feet wide, with 25 feet allocated to vehicle travel lanes and 15 feet allocated to roadway shoulders. The location where the Skyline Trail crosses Route 28 is not indicated by any pavement markings such as a crosswalk. Hikers traveling the length of the Skyline Trail meet Route 28 at a curve in the roadway located at the peak of a hill, making visibility at the intersection difficult for both people driving and people hiking. Trail users can see vehicles approaching the crossing from the north along Route 28, but it is difficult to see vehicles south of the crossing. Guardrails are present on both sides of Route 28 north of the Skyline Trail crossing and on the west side of Route 28 south of the crossing.

On either side of the Skyline Trail Crossing, signage alerts drivers to the presence of the hiking trail. Two hiking trail signs (MUTCD RS-068), each above

<sup>1</sup> The Friends of the Blue Hills Reservation's Find Your Trail Chart states that the route measures nine miles end to end but that the hike is 14-miles long for trail users who culminate their hike where they began. AllTrails describes the Skyline Trail as a 15.2-mile out-and-back route, while DCR's Blue Hills Reservation map states that the Skyline Traverse is 7.5-miles long. The map explains that there is also the Skyline Loop Trail, which measures 2.6-miles in length.

a sign reading "TRAIL XING AHEAD," have been installed on either side of the Skyline Trail along Route 28. Figure 2 shows these signs, which are located approximately 420 feet north (left) and 450 feet south (right) of the Skyline Trail respectively.

Figure 2
Hiking Trail Signs Accompanied by TRAIL XING AHEAD Text

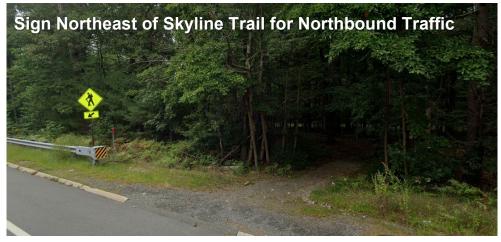




Source: Google Street View (September 2023)

When northbound drivers reach the crossing, a second hiking trail sign is visible just north of the trail. This sign is paired with an arrow that points downward to the left (MUTCD W16-7P), as illustrated in Figure 3. Figure 3 also shows the second hiking trail sign that southbound drivers encounter as they near the Skyline Trail, installed just north of the crossing as well. This hiking trail sign is located above a sign reading "TRAIL XING" (W11-15P).

Figure 3
Hiking Trail Signs for Route 28 Traffic



Source: Google Street View (September 2023)



Source: Google Street View (September 2023)

The entrance to the Skyline Trail on the west side of Route 28 includes a map of the hiking area, but the trail entrance on the east side of the roadway is unmarked aside from the hiking trail sign with an arrow below the sign (Figure 4).

Figure 4
Skyline Trail Entrances



Source: Google Street View (September 2023)



Source: Google Street View (September 2023)

There is space for trail users to park near the entrance to the Skyline Trail on the west side of Route 28. Additional space for vehicles can be found on the west side of the roadway approximately 125 feet south of the crossing. Figure 5 illustrates the location of these two parking locations (P1 and P2 respectively) and the placement of the hiking trail signage along Route 28 for the Skyline Trail crossing.



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A parking area for more Blue Hills Reservation trails (P3) is located on the west side of Route 28 approximately 0.2 miles south of the Skyline Trail crossing. Skyline Trail users could potentially park at this location, which is slightly larger than the parking areas closest to the Skyline Trail, and walk north to access the Skyline Trail, but Route 28 does not include safe pedestrian facilities such as sidewalks or shared-use paths.

#### 2.1 Stakeholder Concerns

Prior to engaging in this study, MPO staff received input about a variety of factors within the vicinity of the Skyline Trail crossing of Route 28 that troubled the Friends of the Blue Hills. They were primarily concerned about the speed and volume of traffic along Route 28, which they explained makes crossing the roadway very difficult, especially for individuals with disabilities or mobility impairments. The organization shared anecdotally that many people traveling along the Skyline Trail turn around once they reach Route 28 to avoid crossing amid the vehicle traffic, which limits use of the Blue Hills Reservation and prevents access to both sides of the conservation area.

The Friends of the Blue Hills also shared their concerns about the impact of Route 28 on wildlife. The Friends explained that the roadway degrades the wildlife habitat and restricts the movement of animals by dividing the Blue Hills Reservation. In addition, the Friends of the Blue Hills expressed interest in a wildlife tunnel if one is warranted at the location, but such an assessment is outside the scope of work for this study.

Finally, the Friends of the Blue Hills would like to explore how bicycle and pedestrian travel could be accommodated along Route 28 from south of the I-93 and I-95 interchange to increase access to the Skyline Trail via both modes. Exploring this idea was also was outside the scope of this study, although future work in this area could analyze Route 28 south of the Skyline Trail to provide recommendations that would improve the safety of walking and bicycling along the roadway.

#### 2.2 Blue Hills Reservation Access

MPO staff completed *Unlocking the Blue Hills* in 2022, an analysis of the equity of access to the Blue Hills Reservation.<sup>2</sup> The study was inspired by the challenges of accessing the Blue Hills Reservation faced by residents of the

<sup>&</sup>lt;sup>2</sup> Boston Region Metropolitan Planning Organization (website). *Unlocking the Blue Hills* (September 2022), accessed May 16, 2024. https://storymaps.arcgis.com/stories/77be5663ee834d37ae73d8f5a98659a4

majority-minority and transit-dependent southern Boston neighborhoods closest to the conservation area. One area of particular concern for stakeholders involved in the study was the difficulty of accessing the Blue Hills from Mattapan, a majority-minority neighborhood with a relatively high percentage of low-income and zero-car households located less than five miles from the Blue Hills.

Key recommendations from the analysis took the form of transit service improvements from April 1 through October 31, the peak visitor season for the Blue Hills Reservation. Options ranged from modifying existing MBTA service to providing new bus services that would create new stops within the conservation area. The intent of the study recommendations was to increase access to the Blue Hills Reservation, particularly for populations who have not been able to easily visit the natural resource in the past. If implemented, the transit improvements have the potential to increase the volume of visitors to the Blue Hills Reservation and its trails. The Skyline Trail, as one of the conservation area's most popular routes, could see considerable increase in usage. It will therefore be particularly important to ensure the safety of the trail's Route 28 crossing for people hiking and increase driver awareness of the crossing.

#### 3 TRAVEL DATA

MPO staff analyzed the travel behavior of both people walking and driving where the Skyline Trail crosses Route 28 in the Blue Hills Reservation. Vehicle speed and volume data for Route 28 were collected in 2022 both north and south of the Skyline Trail crossing from Tuesday, September 27 to Monday, October 3.<sup>3</sup> MPO staff also tested their new automated pedestrian count sensor unit, the Eco-Counter Mobile MULTI, at the study location.<sup>4</sup> MPO staff initially installed the pedestrian counting device from December 2, 2022, to December 12, 2022, and then counted people walking at the location again from August 14, 2023, to August 29, 2023.<sup>5</sup> These data collection locations are illustrated in Figure 6.

<sup>&</sup>lt;sup>3</sup> Data for vehicles traveling north of the Skyline Trail crossing were collected from 4:00 PM Tuesday (09.27.22) to 2:00 PM Monday (10.03.22) for northbound traffic and from 1:00 AM Tuesday (09.27.22) to 2:00 PM Monday (10.03.22) for southbound traffic. Data for vehicles traveling south of the Skyline Trail crossing were collected from 1:00 AM Tuesday (09.27.22) to 1:00 PM Monday (10.03.22) for northbound traffic and from 3:00 PM Tuesday (9.27.22) to 1:00 PM Monday (10.03.22) for southbound traffic.

<sup>&</sup>lt;sup>4</sup> The Boston Region MPO's Eco-Counter Mobile MULTI unit can count both bicyclists and pedestrians, but only the pedestrian counting feature was suitable for the hiking trail location.

<sup>&</sup>lt;sup>5</sup> Data for people walking along the Skyline Trail were collected in December 2022 from 4:00 PM on Friday, December 2, to 2:00 PM on Monday, December 12, and in August 2023 from 3:00 PM on Monday, August 14, to 12:00 PM on Tuesday, August 29.



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Figure 6
Skyline Trail Crossing of Route 28
Count locations

#### 3.1 Vehicle Volumes

More vehicles traveled along Route 28 on weekdays than they did during the weekends. Route 28 experienced the lowest weekday vehicle volumes during AM peak hours for southbound travel, with an average volume of 719 vehicles. Conversely, the weekday AM peak northbound and PM peak southbound both averaged a volume that exceeded 1,400 vehicles. On weekends, peak-hour average volumes ranged from approximately 600 to 850 vehicles.

Table 1

Vehicle Volumes along Route 28 North of the Skyline Trail Crossing

Dovoftho	Date	Total Dail	y Vehicles		AM P	eak <sup>a</sup>		PM Peak <sup>a</sup>			
Day of the Week		Northbound	Caudhhain a	Northb	ound	Southbound		Northbound		Southbound	
Week		Northbound	Southbound	Hour	Volume	Hour	Volume	Hour	Volume	Hour	Volume
Monday	10/3/2022	7,583	3,937	7:00 AM	1,381	9:00 AM	657	1:00 PM	558 <sup>b</sup>	1:00 PM	472 b
Tuesday	9/27/2022	5,159	15,450	N/A <sup>c</sup>	N/A°	12:00 PM	761	4:00 PM	1,042	6:00 PM	1,402
Wednesday	9/28/2022	15,432	13,831	8:00 AM	1,366	9:00 AM	685	6:00 PM	1,130	5:00 PM	1,445
Thursday	9/29/2022	15,266	14,408	8:00 AM	1,468	9:00 AM	682	5:00 PM	938	5:00 PM	1,438
Friday	9/30/2022	16,768	14,191	8:00 AM	1,409	9:00 AM	812	7:00 PM	1,284	5:00 PM	1,423
Saturday	10/1/2022	11,053	11,034	12:00 PM	738	12:00 PM	690	3:00 PM	819	1:00 PM	1010
Sunday	10/2/2022	9,785	9,015	11:00 AM	655	12:00 PM	547	3:00 PM	779	4:00 PM	694
Average	Overall	11,578	11,695	9:00 AM	1,170	10:17 AM	691	4:40 PM	999	4:20 PM	1,235
Weekday	Average	12,042	12,363	7:45 AM	1,406	9:36 AM	719	5:30 PM	1,099	5:15 PM	1,427
Weekend	Average	10,419	10,025	11:30 AM	696.5	12:00 PM	618.5	3:00 PM	799	2:30 PM	852

<sup>&</sup>lt;sup>a</sup> AM and PM Peak volumes represent the AM and PM hour during which the greatest number of vehicles were recorded. The noon (12:00 PM) hour is considered the final hour of the AM period.

<sup>&</sup>lt;sup>b</sup> MPO staff omitted the Monday (10.03.22) PM peak volume from the overall and weekday PM peak-hour averages because vehicles were only counted until 2:00 PM on Monday afternoon.

<sup>&</sup>lt;sup>c</sup> Data collection north of the Skyline Trail for northbound vehicles did not begin until 4:00 PM on Tuesday (9.27.22), so AM peak volumes for northbound vehicles north of the Skyline Trail are not available for Tuesday morning.

N/A = Not Applicable

Table 2
Vehicle Volumes along Route 28 South of the Skyline Trail Crossing

Day of the Week	Date	Total Dail	y Vehicles		AM Peak <sup>a</sup>				PM Peak <sup>a</sup>			
		Northhound	Coudhhaund	North	oound	Southl	oound	Northb	ound	Southbound		
		Northbound	Southbound	Hour	Volume	Hour	Volume	Hour	Volume	Hour	Volume	
Monday	10/3/2022	6,871	3,282	8:00 AM	1,407	9:00 AM	634	N/A <sup>b</sup>	N/A <sup>b</sup>	N/A <sup>b</sup>	N/A <sup>b</sup>	
Tuesday	9/27/2022	14,657	8,458	8:00 AM	1,505	N/A <sup>c</sup>	N/A <sup>c</sup>	4:00 PM	1,013	6:00 PM	1,401	
Wednesday	9/28/2022	15,233	13,456	8:00 AM	1,458	9:00 AM	675	6:00 PM	1,094	5:00 PM	1,409	
Thursday	9/29/2022	15,011	13,961	8:00 AM	1,471	9:00 AM	647	5:00 PM	880	5:00 PM	1,383	
Friday	9/30/2022	16,376	13,592	8:00 AM	1,463	9:00 AM	784	5:00 PM	1,229	6:00 PM	1,360	
Saturday	10/1/2022	10,565	10,641	12:00 PM	715	12:00 PM	685	3:00 PM	786	1:00 PM	974	
Sunday	10/2/2022	9,334	8,743	11:00 AM	627	12:00 PM	547	3:00 PM	756	3:00 PM	693	
Average	Overall	12,578	10,305	9:00 AM	1,235	10:00 AM	662	4:20 PM	960	4:20 PM	1,203	
Weekday	Average	13,630	10,550	8:00 AM	1,461	9:00 AM	685	5:00 PM	1,054	5:30 PM	1,388	
Weekend	Average	9,950	9,692	11:30 AM	671	12:00 PM	616	3:00 PM	771	2:00 PM	834	

<sup>&</sup>lt;sup>a</sup> AM and PM Peak volumes represent the AM and PM hour during which the greatest number of vehicles were recorded. The noon (12:00 PM) hour is considered the final hour of the AM period.

N/A: Not Applicable

<sup>&</sup>lt;sup>b</sup> Data collection south of the Skyline Trail for both directions of travel ended at 1:00 PM on Monday (10.03.22). The noon (12:00 PM) hour is considered the final hour of the AM period, so PM peak volumes for both directions of travel south of the Skyline Trail are not available.

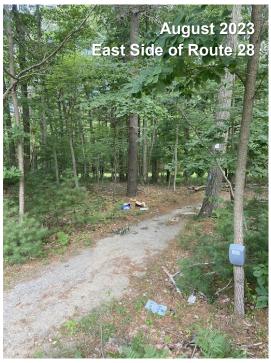
<sup>&</sup>lt;sup>c</sup> Data collection south of the Skyline Trail for southbound vehicles did not begin until 3:00 PM on Tuesday (09.27.22) and therefore did not include AM peak volumes.

#### 3.2 Pedestrian Volumes

Data on pedestrian volumes were collected using an automated pedestrian count sensor, the Eco-Counter Mobile MULTI, which MPO staff installed once on either side of Route 28 at the Skyline Trail's entrances. MPO staff first installed the count sensor on the west side of Route 28 for 10 days in December 2022. When MPO staff installed the device at the study location the second time, they did so on the east side of Route 28 for 15 days in August 2023. These locations are illustrated in Figure 7, which documents both count sensor installations.

Figure 7
Count Sensor Installations





The number of people recorded traveling along the Skyline Trail at Route 28 varied considerably day-to-day, but the overall trends in both December 2022 (Table 3) and August 2023 (Table 4) showed that more people hiked along the Skyline Trail on weekends than on weekdays. Surprisingly, the highest number of total hikers counted along the trail did not occur during August, but instead on Sunday, December 4. Many of the weekdays from the two different collection periods shared comparable volumes, but Wednesdays and Thursdays in August 2023 greatly exceeded the December 2022 volumes (Table 5). Saturdays and Sundays were popular at both times of year, but the Saturday average was higher in August 2023 while December 2022 had a busier Sunday average (Table 5).

It is important to note that, at the time of data collection, MPO staff only owned one automatic pedestrian count sensor, so the data from each collection period only reflect the number of people present on one side of Route 28. Considering the Friends of the Blue Hills' anecdotes about hikers turning around when they reach Route 28 rather than crossing the high-speed roadway, it is possible that the pedestrian volumes collected for this study are incomplete. For a more accurate representation of pedestrian behavior at the Skyline Trail's crossing of Route 28, MPO staff recommend collecting pedestrian volumes at the Skyline Trail simultaneously on both sides of Route 28.

Table 3

December 2022 Skyline Trail Pedestrian Volumes at Route 28

			Direct	ion
Date	Day of the Week	Total	West to the Skyline Trail	East to Route 28
12/2/22	Friday	1	1	0
12/3/22	Saturday	54	26	28
12/4/22	Sunday	198	108	90
12/5/22	Monday	11	7	4
12/6/22	Tuesday	19	11	8
12/7/22	Wednesday	4	1	3
12/8/22	Thursday	20	13	7
12/9/22	Friday	13	7	6
12/10/22	Saturday	83	40	43
12/11/22	Sunday	68	33	35
12/12/22	Monday	12	7	5

Table 4
August 2023 Skyline Trail Pedestrian Volumes at Route 28

	Day of the		Dir	ection
Date	Day of the Week	Total	West to Route 28	East to the Skyline Trail
8/14/23	Monday	9	6	3
8/15/23	Tuesday	7	3	4
8/16/23	Wednesday	81	51	30
8/17/23	Thursday	49	25	24
8/18/23	Friday	8	3	5
8/19/23	Saturday	128	60	68
8/20/23	Sunday	109	55	54
8/21/23	Monday	15	9	6
8/22/23	Tuesday	26	12	14
8/23/23	Wednesday	41	21	20
8/24/23	Thursday	38	14	24
8/25/23	Friday	1	0	1
8/26/23	Saturday	71	34	37
8/27/23	Sunday	123	58	65
8/28/23	Monday	23	14	9
8/29/23	Tuesday	8	5	3

Table 5
Average Daily Pedestrians by Day of the Week

	Average Daily Pedestrians					
Day of the Week	December 2022	August 2023				
Monday	11.5	15.667				
Tuesday	19.0	13.667				
Wednesday	4.0	61.0				
Thursday	20.0	43.5				
Friday	7.0	4.5				
Saturday	68.5	99.5				
Sunday	133.0	116.0				

# 3.3 Vehicle Speeds

The speed limit at the study location is posted at 50 miles per hour (mph). Vehicle traffic traveled at the highest recorded speeds while traveling northbound after passing the Skyline Trail (Tables 6 and 7). Overall, however, average speeds at the study location did not exceed the speed limit at either data collection location for both directions of travel. The 85<sup>th</sup> percentile speeds, reflecting speeds at which 85 percent of vehicles drove, hovered around the 50-mph speed limit for both locations and directions of travel, except for northbound traffic after crossing the Skyline Trail. People driving in this direction were recorded to have an 85<sup>th</sup> percentile speed of 56.8 mph, which is more than 5 mph above the posted speed limit.

Table 6
Vehicle Speeds along Route 28 North of the Skyline Trail Crossing\*

Day of the Week	Date	_	e Speed ph)	85 <sup>th</sup> Percentile Speed (mph)			
Week		Northbound	Southbound	Northbound	Southbound		
Monday	10/3/2022	45.4	45.1	56.1	54.8		
Tuesday	9/27/2022	46.8	39.1	57.4	49.6		
Wednesday	9/28/2022	45.1	40.3	54.9	50.6		
Thursday	9/29/2022	45.1	40.6	55.1	49.7		
Friday	9/30/2022	43.3	41.4	55.0	50.1		
Saturday	10/1/2022	50.4	44.4	58.8	53.4		
Sunday	10/2/2022	50.9	45.2	60.0	55.6		
Average	Overall	46.7	42.3	56.8	52.0		
Weekday	Average	45.1	41.3	55.7	51.0		
Weekend	Average	50.7	44.8	59.4	54.5		

<sup>\*</sup> The location of the speed data collection is illustrated in Figure 6. mph = miles per hour.

Table 7
Vehicle Speeds along Route 28 South of the Skyline Trail Crossing\*

Day of the Week	Date	_	e Speed ph)	85th Percentile Speed (mph)			
		Northbound	Southbound	Northbound	Southbound		
Monday	10/3/2022	40.8	41.5	51.0	52.4		
Tuesday	9/27/2022	39.7	35.2	51.3	44.6		
Wednesday	9/28/2022	39.8	37.3	50.6	48.0		
Thursday	9/29/2022	40.5	37.9	51.3	47.4		
Friday	9/30/2022	39.4	38.2	51.0	48.1		
Saturday	10/1/2022	43.0	40.9	53.8	50.4		
Sunday	10/2/2022	42.8	41.1	54.5	52.3		
Average	Overall	40.9	38.9	51.9	49.0		
Weekday	Average	40.0	38.0	51.0	48.1		
Weekend	Average	42.9	41.0	54.2	51.4		

<sup>\*</sup> The location of the speed data collection is illustrated in Figure 6. mph = miles per hour.

Vehicle speeds were found to be faster on the weekends, compared to weekdays. This coincides with the days of the week when vehicle volumes were lowest. Unfortunately, weekends are also when the Skyline Trail experiences the greatest level of use (see Section 3.2). To encourage the greatest level of safety, especially when high vehicle speeds are coupled with high pedestrian volumes on weekends, modifications need to be made to the current Route 28 crossing location.

While overall vehicle speeds at the study location are within a reasonable margin of the posted speed limit, the experience of trail users when trying to cross Route 28 is negatively impacting their ability to travel along the Skyline Trail. This suggests that vehicle speeds need to be reduced at the crossing location. In addition to lowering the speed limit, there are changes that can be made to the physical configuration of the roadway and the trail entrances to encourage safer driver behavior and greater pedestrian visibility.

#### 4 PROPOSED SOLUTIONS

MPO staff propose a number of recommended changes to Route 28 where the Skyline Trail crosses the roadway. To improve the safety of the Skyline Trail crossing of Route 28 for all users, it will be important to increase awareness of the crossing, improve visibility, and slow vehicle speeds. Striping the location with high-visibility crosswalk markings and improving signage leading up to and at the crossing are the first steps to drawing drivers' attention to the presence of the Skyline Trail. However, additional countermeasures detailed in the following sections would need to accompany the roadway striping to ensure that the location does not provide a false sense of security.

The other countermeasures MPO staff recommend include installing rumble strips ahead of the crossing, adding a median and pedestrian bump outs to narrow the roadway and improve crossing visibility for both drivers and trail users, and raising the roadway at the location of the Skyline Trail to slow the speeds at which people drive through the conflict point. MPO staff also suggest installing rectangular rapid flashing beacons on each side of Route 28 at the study location to allow hikers to alert drivers of their presence. All these changes should be accompanied by increased Skyline Trail crossing signage to raise driver awareness of the potential for crossing hikers.

# 4.1 Crosswalk Striping and Signage

Adding high-visibility crosswalk markings to the trail crossing is a quick and low-cost modification that has the potential to substantially improve the location for Skyline Trail hikers. Improvements to the visibility and frequency of the signage

along Route 28, when paired with crosswalk markings, will raise driver awareness of the Skyline Trail's presence and the potential for crossing hikers.

Clear hiking trail signage should inform drivers of the trail crossing location. A sign that specifies that the hiking trail is the Skyline Trail also would be informative for people interested in accessing the Blue Hills Reservation's recreational offerings. In addition, more signage at the trailheads on each side of the roadway, including a map of the Blue Hills Reservation on the east side of the roadway, would be helpful for hikers' navigation and trip-planning purposes. MassDOT does not typically allow parking on its roadways, however, so any proposal to formally sign the parking areas on the west side of Route 28 is likely to be rejected.

Finally, to communicate that motorists are expected to slow their vehicles at the crossing location, MPO staff recommend installing signage ahead of the Skyline Trail crossing in both directions that indicates a speed limit of 35 mph or slower.

## 4.2 Rumble Strips

Installing transverse rumble strips both north and south of the Skyline Trail at two points, one approximately 300 feet before the crossing and another immediately before it, will alert drivers to a change in the roadway that requires their attention. These grooves in the road surface are installed within the travel lane perpendicular to the direction of travel, creating vibrations and noise within vehicles that would help indicate the presence of the Skyline Trail crossing to motorists.

MPO staff recommend the use of transverse rumble strips instead of speed bumps because MassDOT does not install speed bumps on state highways. MassDOT is concerned about their impact on snowplows and the ability of speed bumps to damage vehicles or lead to crashes on high-speed roadways. Fortunately, there is already precedent in the Blue Hills Reservation for the installation of transverse rumble strips where Purgatory Road meets Chickatawbut Road (Figure 8).

Figure 8 Transverse Rumble Strips on Chickatawbut Road at Purgatory Road

Source: Google Street View (August 2018)

#### 4.3 Median and Bump-out Pedestrian Zones

MPO staff recommend tightening the vehicle lanes to 12-foot widths by adding a median between the two travel lanes and creating bump-out pedestrian zones on either side of Route 28. In addition to slowing speeds, narrowing the roadway will make pedestrians more visible to motorists. These changes should also help people hiking feel safer standing closer to the vehicle lanes, which would improve hikers' ability to see approaching vehicle traffic. Furthermore, by separating the Route 28 crossing into two stages with the addition of the median, pedestrians will only need to wait for a break in one direction of vehicle traffic at a time.

Figure 9 shows an image of a median in Cambridge while Figure 10 illustrates an urban application of a pedestrian bump out. These are typically referred to as curb extensions, but curbs are not present in the study area.

Broadway, Cambridge, MA

Figure 9
Median/Crossing Island/Pedestrian Refuge

Source: Google Street View (July 2018)

Figure 10
Pedestrian Zone Bump Out (Curb Extension) in an Urban Setting



Source: City of Boston Street Planning and Design Glossary Video (59 seconds)

When making these improvements to the Skyline Trail crossing of Route 28, it will be important to ensure that any changes made to the space are context sensitive. Stakeholders suggested building a wooden structure for the pedestrian bump outs instead of pouring concrete, which would be the typical construction for such pedestrian improvements in an urban setting. Using natural materials or vegetation planters to create pedestrian bump out barriers would minimize the impact of the trail crossing improvements on the natural wildlife habitat. It is important to note, however, that MassDOT has expressed that wooden curb extensions would get damaged by their snowplows and could introduce drainage concerns.

#### 4.4 Raised Crosswalk

MPO staff recommend creating a raised crosswalk at the crossing location to slow vehicle travel speeds and increase driver awareness that the location is a pedestrian crossing. Figure 11 shows an example of a raised crosswalk. Signage beside the intervention should alert motorists to the change in pavement level. Further clarification from MassDOT will be required as to whether MassDOT will support the installation of raised crossings on state highways.



Figure 11
Raised Crosswalk

Source: City of Boston Street Planning and Design Glossary Video (2 minutes 31 seconds)

# 4.5 Rectangular Rapid Flashing Beacons

Finally, MPO staff recommend adding rectangular rapid flashing beacons (RRFBs) to the Skyline Trail, one on either side of the raised crosswalk, to alert

drivers to the presence of people waiting to cross Route 28. An example of these beacons can be seen in Figure 12.

While the current roadway configuration at the study location qualifies the crossing for a Pedestrian Hybrid Beacon (PHB) according to Federal Highway Administration guidance, MPO staff's recommendations to install a median as a pedestrian refuge island, add curb bump outs, and slow vehicle speeds would make the Skyline Trail crossing a prime location for RRFBs.<sup>6</sup> <sup>7</sup> RRFBs can be powered using solar energy, but coordination with and approval from DCR would ensure that the beacons do not have a detrimental impact on wildlife in the vicinity of the Skyline Trail crossing.

MPO staff would support the installation of PHBs at the study location but express concern regarding the cost and amount of time required for such an installation. Providing for the safety of people hiking in the Blue Hills Reservation rapidly may be more feasible with options that are lower in cost and quickly installed, such as RRFBs. Additionally, MPO staff anticipate greater potential for wildlife impact concerns with PHBs than RRFBs.

For these same two reasons of cost and time, the MPO staff have not included a pedestrian bridge among their top improvement recommendations for the Skyline Trail crossing. The Friends of the Blue Hills have expressed their interest in the construction of a pedestrian bridge at the study location and MPO staff support the construction of such a structure for safety purposes. Given how long such a project would take to come to fruition and the wildlife mitigation that a pedestrian bridge would require, MPO staff believe that safety would be most swiftly served by executing the recommendations previously outlined.

Figure 13 summarizes the improvements that MPO staff recommend where the Skyline Trail crosses Route 28 and Table 8 provides time and cost estimates for the modifications recommended by MPO staff.

<sup>&</sup>lt;sup>6</sup> Federal Highway Administration. *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations* (July 2018).

<sup>&</sup>lt;sup>7</sup> Federal Highway Administration. *Field Guide for Selecting Countermeasures at Uncontrolled Pedestrian Crossing Locations* (July 2018).

Figure 12
Rectangular Rapid Flashing Beacons



Source: City of Boston Street Planning and Design Glossary Video (3 minutes 30 seconds)

Table 8
Cost and Time Estimates for Crossing Modifications

Crossing Modification	Time Estimate	Cost Estimate
Crosswalk Markings <sup>a</sup>	Short-Term	\$4.50/foot
Signage	Short-Term	\$25/square foot installed
Rumble Strips	Short-Term	\$900 minimum (\$300 per rumble strip, minimum of 3 per day)
Curb Extensions b c	Short-Term	\$4,000
Rectangular Rapid Flashing Beacons d	Short-Term	\$12,000-\$15,000
Median	Moderate-Term	\$6,000
Raised Crosswalk be	Moderate-Term	\$8,500

<sup>&</sup>lt;sup>a</sup> This estimate assumes a 12-inch Thermoplastic line.

<sup>&</sup>lt;sup>b</sup> This estimate does not include the cost of excavation, gravel, safety items, or other roadway construction components. An estimate of \$15,000 - \$20,000 was provided as the total for both a raised crosswalk across Route 28 and curb extensions on both sides of the roadway. The higher estimate includes excavation, gravel, fine grading, curbing (curved and straight), concrete, hot mix asphalt (HMA), signage, safety additions, and other miscellaneous additions associated with these roadway improvements. Costs are dependent on each contract's bid prices, so this is a conservative estimate.

<sup>&</sup>lt;sup>c</sup> This estimate assumes the use of traditional granite curb extensions with concrete on each side of the roadway. This type of improvement could be quickly implemented using less expensive, natural materials, such as wood and planters, to construct contextually-appropriate curb extensions.

<sup>&</sup>lt;sup>d</sup> Rectangular rapid flashing beacons can be installed on signposts (P5) or on signal poles with foundations. The cost varies depending on the type of installation. This cost estimate includes two rectangular rapid flashing beacons, one on either side of a two-lane roadway.

<sup>&</sup>lt;sup>e</sup> These calculations assume the use of hot mix asphalt (HMA) for the raised crosswalk.



BOSTON REGION MPO



Figure 13
Skyline Trail Crossing of Route 28
Improvement Recommendations

Community Transportation Technical Assistance Program

#### 5 CONCLUSION

The proposed improvements for where the Skyline Trail crosses Route 28 will require coordination among the variety of entities that have jurisdiction over elements of the study area: the City of Quincy, MassDOT, MassDOT District 6, and DCR. Furthermore, it will be important for the Friends of the Blue Hills to be involved in this endeavor to ensure that any changes made to the area suit the needs of people hiking along the Skyline Trail.

Implementing the crossing improvements proposed in this study of the Skyline Trail's intersection with Route 28 will improve safety for all road users. The impact of the changes for people hiking along the Skyline Trail could also increase trail usage and alter behavior patterns. A greater sense of safety and comfort when crossing Route 28 could encourage more hikers to continue to walk along the Skyline Trail rather than turning back upon reaching Route 28. Improvements to this important crossing in the Blue Hills Reservation trail system have the potential to increase access to a much greater area of the nature preserve for all residents throughout the Boston metropolitan region.

Appendices: Automatic Traffic Recorder (ATR) Data Vehicle Travel Speed Data

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# AUTOMATIC TRAFFIC RECORDER (ATR) DATA

#### WEEKLY SUMMARY FOR LANE 1 Starting: 9/27/2022

Station #: 220230000017 Site ID: 110000000101 Location: Rte.28 NB, S. of Skyline Trail Crossing

Direction: NORTH

STA . I NB File: D0926002.prn City: Quincy County: speed

TIME	MON 3	TUE 27	WED 28	THU 29	FRI 30	WKDAY AVG	SAT 1	SUN 2	WEEK AVG	TOTAL
01 00	0.0	- c	5.6	7.6	0.7		4.00	4.5.0		
						75			94	
02:00	47	35	34	47		41				453
03:00 04:00	33 35 129	33 38	28 30	31	55 41	36	66	118	52	364
05:00	120	135	135	158	122	126	51 61	65 52	42	292
06:00	757	133	803	770	122	136 777	148	106	113 591	792
	1380	1419			1375		364			4140 7613
	1407	1505					351			
09:00	1171	1348	1371	1429	1463 1005	1265	492	339	1128 1022	7894 7 <b>1</b> 55
10:00	11/1	1063	1071	1131			614		1022	5907
11:00	694 560	648	933	733	809 623	954 699	645	627	844	4769
	560	559	679	635	655	618	715	596	628	4769
13:00	300	614	595		699	641	692	643		3899
14:00		699	673		961	746	726		736	4413
15:00		810	846	822	1114	898	786		856	5134
16:00		1013		855	1025	900	684		834	5003
17:00		714	709 757	880	1023	838	658	580	765	4590
18:00		745	1094	813	1051	926	649	595	824	4947
19:00		865	941	717	1229	938		588	825	4951
20:00		465	532		940	613			576	3453
21:00		371	399		420	399				2564
22:00					366	324	363	274	322	1935
23:00		216	243	281	383	281	336	244	284	
24:00		145	154	151	206	164	232	274 244 134	170	1022
TOTALS										
% AVG WKDY	45.3	96.7	100.5	99.0	108.0		69.7	61.6		
% AVG WEEK	50.5			110.2	120.3		77.6	68.5		
AM Times	08:00	08:00	08:00	08:00	08:00	08:00	12:00	11:00	08:00	
AM Peaks	1407	1505	1458	1471	1463	1461	715	627	1128	
PM Times		16:00	18:00	17:00	19:00	19:00	15:00	15:00	15:00	
PM Peaks			1094	880	1229	938	786	756	856	

# WEEKLY SUMMARY FOR LANE 1

Starting: 9/27/2022

Station #: 220230000033 Site ID: 110000000102

STA 15B File: D0927002.prn City: Quincy County: speed

Location: Rte.28 SB, S. of Skyline Trail Crossing

Direction: SOUTH

TIME	MON 3			29		WKDAY AVG	1		AVG	TOTAL
	117		149	156		140			164	984
02:00	60		59	66		64		204		595
03:00	48		43			45				370
04:00	49								53	317
05:00	40		50	48	46	46	74	55	52	313
06:00	109 258 521		111	129	104	113 284 575	89	52	99	594
07:00	258		304	302	271	284	163	102	233	1400
08:00	521		569	633	578	575	364	235	483	2900
09:00	634		675	647	784	685	465	294		3499
10:00	490		587	593	592	566	508	379	525	3149
11:00	479		498	513	616	526	587	506	533	3199
12:00	477		535	574		555	685		575	3451
13:00			600	625	662	629	974	592	691	3453
14:00			712	652	642	669	859	683	710	3548
15:00		852		845	991	890	698	693	825	4949
16:00		1369	1357	1337	1277		741		1127	6764
17:00		1384	1409	1383	1330	1376	663	577	1124	6746
18:00		1401	1372	1357	1000	1372	602	547	1106	6639
19:00		1207	1226	1371			556	471	970	5821
20:00		673	707	950	654	746	540		662	3974
21:00		508 403	471 380	597	526	526	438	427	494	2967
22:00		403	380	401		405 390	384	374	396	2378
23:00		361	411	370	416	390	367	272	366	2197
24:00			324		386	340				1926
TOTALS						13511			12253	
% AVG WKDY	24.3	62.6	99.6	103.3	100.6		78.8	64.7		
% AVG WEEK	26.8	69.0	109.8	113.9	110.9			71.4		
AM Times	09:00		09:00	09:00	09:00	09:00	12:00	12:00	09:00	
AM Peaks	634		675			685				
PM Times		18:00	17:00	17:00	18:00	17:00	13:00	15:00	16:00	
PM Peaks		1401	1409	1383	1360	1376	974	693	1127	

WEEKLY SUMMARY FOR LANE 1 Starting: 9/27/2022

STA, 2NB Station #: 220230000138

Location: Rte.28 NB, N. of Skyline Trail Crossing Direction: NORTH

Site ID: 110000000201

File: D0927004.prn City: Quincy County: speed

Direction: N	ORTH									
TIME	3	27	28	29	30	AVG	1	2	WEEK AVG	
01:00	106		57	79	87	82	123	166	103	618
02:00	49		38	46	43	44	111		71	
03:00	37		29	30	58	38	70	124	58	348
04:00	39 132 822		31	36	41	37	53	70	45 113	270
05:00	132		136	170	125	141	61	52	113	676
06:00	822		870			804	148	107	579	3472
07:00	1381		1360	1397	1362	1375	379	263	1024	6142
	1366			1468						6238
	1169		1292	1315	1037			351	945	5672
10:00	745 568		1058	1088	845 658	934 753	632		820	4917
11:00	568		992	795	658		654	655	720	4322
	611				692	656	738	02,	000	
	558			689		656				
14:00					967			708		
15:00			874	838 923	1131		819	779		
16:00		1042		923	1052	937	727	770	874	
17:00		785	781	938	1029	883	697	614	807	
18:00		805		850		970				5189
			976		1284					
20:00		495	548	527	934	626		483	591	3544
21:00		389	418	410	439 368	414			446	
22:00		316	324	319	368	332	381	287	332	1995
23:00		221				293				1792
24:00		150	159	156	223	172	246	134	178	1068
TOTALS	7583	5159	15432	15266	16765	15486	11053	9785	13783	81043
% AVG WKDY	49.0	33.3	99.7	98.6	108.3		71.4	63.2		
% AVG WEEK				110.8	121.6		80.2	71.0		
	0 = 00		^^ ^		00.00		10.00	11 00		
AM Times	07:00					08:00				
AM Peaks	1381		1366	1468	1409	1402	738	655	1040	
PM Times	13:00	16:00	18:00	17:00	19:00	19:00	15:00	15:00	15:00	
PM Peaks	558	1042	1130	938	1284	996	819	779	888	

#### Mass Highway Department

# WEEKLY SUMMARY FOR LANE 1 Starting: 9/27/2022

Station #: 220230000146 Site ID: 110000000202

Location: Rte.28 SB, N. of Skyline Trail Crossing

Direction: SOUTH

57A. 25B File: D0926008.prn

City: Quincy County: speed

TIME	MON 3	TUE 27	WED 28			WKDAY AVG				TOTAL
0.1 0.0	110	100	4.50	1.60		150				
	119	187			142	153			172	1204
02:00	65 47	89	62 43	68 36	75 53	72 49	142	208 88	101	709
	53	68 73	43 37		38			88 84	63	442
		72								399
	43	170 532	54			71				486
06:00 07:00	110 272	532 671	117 328	122 311	111 290	198	89	50 98	162	1131
	272 574			676		374	171		306	2141
08:00 09:00	657	629 724	601 685	682	615 812	619 712	378 498	247 303	531	3720
10:00	524	751	599	591	640	621	498 516	413	623 576	4361
11:00	509	717	540		646	596	619	533	576 590	4034
	492	761	540 578	621	673	625	690	533 547	623	4130
13:00	492	736	622	651		635		629		4362
14:00	4/2	715	683	659	696 649	676	1010 876	629 673	688	4816
15:00		715 899	889	867	1046	925	703	673 671	709	4255
16:00		1394	1355	1366	1350	925 1366	703	694	846	5075
17:00		1394	1445	1438	1423		688		1155	6929
18:00		1402	1445	1375	1392	1426 1395	638	612 575	1168	7005
19:00			1243	1375		1395	581	5/5	1132 990	6793
20:00		1226	1243	1397	989 689	1214	564	458		5939
21:00		701 536	722 489	974 611		772 544			685	4108
22:00		408	489	420	541 446	419	465	438 399	513	3080
23:00		408		379	440	399	411 386		414	2485
24:00		305				354				
24:00		305	353	364	395	354 	33∠ 		332 	1989
TOTALS	3937	15450	13831	14408	14191	14260	11034	9015	12884	81866
	27.6	108.3			99.5		77.4			
% AVG WEEK	30.6	119.9	107.4	111.8	110.1		85.6	70.0		
AM Times	09:00	12:00	09:00	09:00	09:00	09:00	12:00	12:00	09:00	
AM Peaks	657	761	685	682	812	712	690	547	623	
PM Times	13:00	18:00	17:00	17:00	17:00	17:00	13:00	16:00	17:00	
PM Peaks						1426			1168	

# VEHICLE TRAVEL SPEED DATA Collected South of Skyline Trail Crossing



SPEED SUMMARY Tue 9/27/2022

STA. INB

Station #: 220230000017

Site ID: 11000000101

Location: Rte.28 NB, S. of Skyline Trail Crossing

Direction: NORTH

Lane: 1

File: D0926002.prn City: Quincy County: speed

TIME	<10	<15	<20	<25	<30	<35	<40	<45	<50	<55	<60	<65	<70	<250	Total
01:00	8	7	1	0	0	0	0	7	8	8	11	. 1	3	2	56
02:00	11	5	0	0	0	0	0	2	3	3	7	2	0	2	35
03:00	5	3	3	0	0	0	0	4	4	5	6	2	1	0	33
04:00	6	6	2	0	0	0	0	4	10	2	5	1	1	1	38
05:00	15	22	6	0	0	0	0	6	17	20	25	12	6	6	135
06:00	231	65	5	1	1	7	65	115	137	84	40	25	17	59	852
07:00	262	22	5	6	27	110	294	347	66	11	1	24	30	214	1419
08:00	239	46	57	76	84	175	316	213	31	7	10	31	43	177	1505
09:00	292	26	0	5	39	132	293	246	49	2	7	16	38	203	1348
10:00	267	58	0	2	23	68	138	202	65	28	13	31	28	140	1063
11:00	193	66	1	0	2	3	27	118	76	51	24	7	5	75	648
12:00	184	70	1	0	2	9	22	61	84	47	26	7	0	46	559
13:00	178	57	6	0	1	11	66	86	86	51	17	3	1	51	614
14:00	179	38	4	1	12	30	72	125	98	44	17	3	1	75	699
15:00	277	52	10	9	19	22	62	125	96	37	18	4	5	74	810
16:00	237	62	43	71	99	108	100	108	84	18	1	3	12	67	1013
17:00	229	95	5	1	4	3	36	77	114	44	20	5	7	74	714
18:00	260	57	5	0	8	6	32	128	118	52	10	6	2	61	745
19:00	268	67	2	0	0	12	72	167	109	46	16	3	2	101	865
20:00	124	53	2	0	1	2	29	65	80	61	26	3	1	18	465
21:00	65	39	4	0	8	1	6	46	93	54	22	4	0	29	371
22:00	71	48	0	0	0	1	4	28	57	63	17	6	0	14	309
23:00	26	33	4	0	0	0	3	29	34	30	27	17	3	10	216
24:00	18	14	0	0	0	0	5	2	25	23	37	13	2	6	145
DAY TOTAL	3645	1011	166	172	330	700	1642	2311	1544	791	403	229	208	1505	14657
PERCENTS	24.9%	6.9%	1.1%	1.2%	2.3%	4.8%	11.2%	15.8%	10.5%	5.4%	2.7%	1.6%	1.4%	10.3%	100.0%

Statistical Information...

15th Percentile Speed 26.2 mph

Median Speed 41.6 mph

10 MPH Pace Speed
35 mph to 45 mph
2311 vehicles in pace
Representing 24.3% of the total vehicles

85th Percentile Speed 51.3 mph

Average Speed 39.7 mph

Vehicles > 65 MPH 208 2.2%

#### SPEED SUMMARY Wed 9/28/2022

Station #: 220230000017
Site ID: 110000000101
Location: Rte.28 NB, S. of Skyline Trail Crossing
County: speed

Direction: NORTH

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	<40	<45	<50	<55	<60	<65	<70	<250	Total
01.00	F	_	_	0	0	0	0	4		1.0	_				
01:00	5	6	6	0	0	0	0	4	6	10	6	6	2	5	56
02:00	3	4	2	0	0	0	1	2	5	6	6	3	1	1	34
03:00	2 5	4 1	0	0	0	0	0	5	7	4	2	2	2	0	28
04:00	21		4	0	0	0	0	0	3	8	3	5	0	1	30
05:00		19	6	3	0	0	0	1	22	13	29	14	4	3	135
06:00	192	74	6	0	Τ	2	38	100	143	127	64	17	7	32	803
07:00	236	39	Τ	0	9	76	330	388	93	16	4	6	22	160	1380
08:00	245	36	0	1	45	141	336	298	75	10	1	20	30	220	1458
09:00	261	29	0	0	4	41	381	344	72	6	1	14	28	190	1371
10:00	294	41	Ţ	0	3	37	208	211	81	32	10	10	22	121	1071
11:00	297	87	0	1	3	7	52	139	143	50	17	3	4	130	933
12:00	209	47	0	0	3	16	58	101	106	38	15	1	8	77	679
13:00	198	59	4	7	4	12	27	96	72	48	7	7	1	53	595
14:00	228	52	0	0	0	15	38	111	107	53	13	4	0	52	673
15:00	274	91	0	0	13	22	76	116	100	41	18	10	7	78	846
16:00	262	56	0	2	8	12	42	127	81	21	7	6	5	80	709
17:00	253	68	1	0	5	31	91	107	91	32	6	2	2	68	757
18:00	223	106	113	114	115	64	57	83	87	19	17	20	16	60	1094
19:00	204	64	26	28	75	61	94	109	88	55	20	13	18	86	941
20:00	128	55	4	0	7	18	31	83	86	46	20	2	3	49	532
21:00	84	20	0	0	1	5	17	63	98	52	31	7	2	19	399
22:00	51	30	4	0	0	1	3	38	63	51	39	10	7	15	312
23:00	30	24	6	0	1	2	8	27	50	41	24	24	2	4	243
24:00	24	12	6	0	0	1	5	18	24	29	16	8	3	8	154
DAY TOTAL PERCENTS	3729 24.5%	1024	190 1.2%	156 1.0%	297 1.9%	564 3.7%	1893 12.4%	2571 16.9%	1703 11.2%	808 5.3%	376 2.5%	214	196 1.3%	1512 9.9%	15233 100.0%

Statistical Information...

15th Percentile Speed 27.2 mph

Median Speed 41.7 mph

10 MPH Pace Speed
35 mph to 45 mph
2571 vehicles in pace
Representing 25.7% of the total vehicles

85th Percentile Speed 50.6 mph

Average Speed 39.8 mph

Vehicles > 65 MPH 196 2.0%

#### SPEED SUMMARY Thu 9/29/2022

Station #: 220230000017 File: D0926002.prn
Site ID: 110000000101 City: Quincy
Location: Rte.28 NB, S. of Skyline Trail Crossing County: speed

Direction: NORTH

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	<40	< 45	<50	<55	<60	<65	<70	<250	Total
01:00	6	8	0	0	0	0	0	2	24	11	18	3	1	3	76
02:00	4	6	1	0	0	0	0	5	11	3	8	4	1	4	47
03:00	2	2	1	0	0	0	2	3	4	4	6	5	2	0	31
04:00	4	1	2	0	0	0	0	1	9	2	4	4	3	2	32
05:00	23	14	5	0	1	1	1	8	16	30	17	26	3	13	158
06:00	161	66	13	0	3	7	30	109	153	113	63	16	4	32	770
07:00	232	27	0	1	7	81	377	427	84	13	3	5	34	151	1442
08:00	227	56	36	60	91	150	403	193	17	2	7	34	41	154	1471
0.9:00	208	31	9	15	21	180	420	271	25	6	3	19	47	174	1429
10:00	214	47	8	42	35	68	149	259	122	31	7	17	-7	125	1131
11:00	230	76	1	2	2	2	29	108	107	57	17	11	4	87	733
12:00	188	48	2	7	7	15	47	79	91	57	12	20	5	57	635
13:00	235	64	3	0	2	8	25	98	95	36	26	2	2	60	656
14:00	211	77	1	0	5	5	23	102	96	57	20	1	2	49	649
15:00	266	67	2	0	1	33	84	122	102	31	16	7	14	77	822
16:00	275	71	4	1	0	1	44	168	153	36	15	1	4	82	855
17:00	270	70	16	31	30	25	56	127	107	41	10	4	7	86	880
18:00	228	81	1	0	2	20	56	114	140	64	25	6	1	75	813
19:00	180	74	0	1	3	11	64	138	114	45	17	10	3	57	717
20:00	105	33	2	0	3	11	41	113	101	46	16	2	2	41	516
21:00	62	31	3	0	1	3	20	90	96	46	27	8	1	17	405
22:00	31	25	3	0	0	0	1	50	86	63	37	6	4	5	311
23:00	37	23	2	0	0	0	13	21	58	54	41	19	0	13	281
24:00	12	4	10	0	0	2	0	26	26	24	31	12	1	3	151
DAY TOTAL PERCENTS	3411	1002 6.7%	125 0.8%	160 1.1%	214	623 4.2%	1885 12.6%	2634 17.5%	1837 12.2%	872 5.8%	446 3.0%	242 1.6%	193	1367 9.1%	15011 100.0%

Statistical Information...

15th Percentile Speed 30.3 mph

Median Speed 42.1 mph

10 MPH Pace Speed
35 mph to 45 mph
2634 vehicles in pace
Representing 25.7% of the total vehicles

85th Percentile Speed 51.3 mph

Average Speed 40.5 mph

Vehicles > 65 MPH 193 1.9%

#### SPEED SUMMARY Fri 9/30/2022

Station #: 220230000017
Site ID: 110000000101
Location: Rte.28 NB, S. of Skyline Trail Crossing

File: D0926002.prn
City: Quincy
County: speed

Direction: NORTH

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	<40	<45	<50	<55	<60	<65	<70	<250	Total
01:00	5	6	1	0	0	0	3	13	23	18	0	7	0	0	0.7
02:00	1	4	0	0	0	0	1				9 8		0	2	87
03:00	4	6	0	0	0	0	0	4	12 8	5 16	7	5 7	1	1	42
04:00	2	2	0	0	0	0	0	4	9		9	3	1	2	55
05:00	8	12	4	0	0	0	0	4 6	16	11 25	19	_	⊥ 7	0	41
06:00	123	54	2	0	0	0	19	111	139	25 115	90	19 27		6	122
07:00	188	39	0	2	4	73	319	448					9	15	704
08:00	230	35		6	21	108	401	386	120	19	8	12	31	112	1375
09:00	224	50	4	0	7	38	120	215	62	9 61	4	24	28	145	1463
10:00	199	51	2	0	,	38 6	66		160	73	16 33	10	11	93	1005
11:00	223	44	3	1	3		27	154 99	164			5	4	49	809
12:00	223	76	0	Ü	~	0			113	34	17	4	8	50	623
			~	-	5 17	2	27	83	105	49	10	5	5	66	655
13:00	216	58	2	7		13	40	96	96	60	12	5	13	64	699
14:00	290	65	8 7	2	27	62	136	135	70	28	20	6	18	94	961
15:00	272	41	,	17	41	83	247	190	53	23	4	9	21	106	1114
16:00	260	108	71	90	60	59	77	87	82	27	14	15.	12	63	1025
17:00	229	139	93	76	68	43	68	81	75	32	19	8	10	60	1001
18:00	193	125	109	99	61	48	96	128	61	35	3	11	7	75	1051
19:00	216	45	10	29	39	114	237	243	81	22	7	25	33	128	1229
20:00	131	47	10	18	51	102	151	145	109	42	13	11	18	92	940
21:00	66	48	1	0	0	2	5	64	90	73	37	18	0	16	420
22:00	35	44	3	1	0	15	3	49	93	59	37	6	5	16	366
23:00	48	45	6	0	0	0	1	42	101	73	39	19	3	6	383
24:00	26	15 	2	0	0	0	3	16	56 	35	36	13	0	4	206
DAY TOTAL PERCENTS	3 <b>4</b> 11 20.8%	1159 7.1%	338 2.1%	348 2.1%	404 2.5%	768 4.7%	2047 12.5%	2803 17.1%	1898 11.6%	944 5.8%	471 2.9%	274 1.7%	246 1.5%	1265 7.7%	16376 100.0%

Statistical Information...

15th Percentile Speed 23.7 mph

Median Speed 41.4 mph

10 MPH Pace Speed
35 mph to 45 mph
2803 vehicles in pace
Representing 24.0% of the total vehicles

85th Percentile Speed 51.0 mph

Average Speed 39.4 mph

Vehicles > 65 MPH 246 2.1%

Page: 6 Sat 10/1/2022

Site ID: 110000000101 Location: Rte.28 NB, S. of Skyline Trail Crossing

City: Quincy County: speed

File: D0926002.prn

Direction: NORTH

Station #: 220230000017

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	<40	<45	<50	<55	<60	<65	<70	<250	Total
0.1 0.0		2.0	_												
01:00	11	11	6	0	0	0	0	7	34	25	12	8	2	7	123
02:00	5	7	1	0	0	0	4	22	21	19	18	15	2	5	109
03:00	5	2	4	0	0	0	1	10	11	12	9	5	2	5	66
04:00	Ţ	3	0	0	0	0	0	4	10	9	16	7	0	1	51
05:00	2	3	0	Ţ	0	2	0	3	12	11	11	9	4	3	61
06:00	21	20	3	0	0	0	6	3	22	27	28	11	0	7	148
07:00	56	40	4	0	1	2	1	15	74	79	61	19	4	8	364
08:00	56	47	4	0	0	2	4	24	78	60	53	11	2	10	351
09:00	89	41	1	0	0	0	15	67	138	73	45	12	0	11	492
10:00	79	54	1	2	8	6	53	147	158	42	29	6	1	28	614
11:00	115	63	4	0	1	4	42	132	168	70	18	8	2	18	645
12:00	166	71	1	0	0	1	32	143	194	51	19	5	1	31	715
13:00	158	52	4	0	0	2	38	162	159	50	10	0	4	53	692
14:00	154	6:3	3	0	8	9	39	137	170	71	21	8	3	40	726
15:00	214	78	2	0	1	6	49	118	133	86	35	3	7	54	786
16:00	172	74	3	1	0	2	16	109	183	53	16	4	1	50	684
17:00	172	76	6	2	0	2	20	69	151	80	27	3	6	44	658
18:00	170	62	6	0	3	5	12	68	168	79	47	2	0	27	649
19:00	154	50	5	0	1	0	15	101	123	86	42	3	3	28	611
20:00	96	46	4	0	0	2	29	109	119	70	18	9	1	30	533
21:00	121	47	4	0	0	0	22	93	115	82	20	19	7	26	556
22:00	68	53	1	0	0	1	6	51	97	51	19	4	1	11	363
23:00	61	27	3	0	1	1	4	51	60	70	30	10	0	18	336
24:00	42	30	4	0	0	0	9	21	49	36	24	8	2	7	232
DAY TOTAL	2188	1020	74	6	24	47	417	1666	2447	1292	628	179	55	522	10565
PERCENTS	20.7%	9.7%	0.7%	0.1%	0.2%	0.4%	3.9%	15.8%	23.2%	12.2%	5.98	1.7%	0.5%	4.98	100.0%

Statistical Information...

15th Percentile Speed 35.1 mph

Median Speed 46.4 mph

10 MPH Pace Speed 40 mph to 50 mph 2447 vehicles in pace Representing 31.2% of the total vehicles 85th Percentile Speed 53.8 mph

Average Speed 43.0 mph

Vehicles > 65 MPH 55 0.7%

#### SPEED SUMMARY Sun 10/2/2022

Station #: 220230000017
Site ID: 110000000101
Location: Rte.28 NB, S. of Skyline Trail Crossing

File: D0926002.prn
City: Quincy
County: speed

Direction: NORTH

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	<40	< 45	<50 	<55	<60	<65	<70	<250	Total
														<b>_</b>	
01:00	16	14	6	1	0	0	1	21	34	23	20	9	1	13	159
02:00	13	9	5	0	0	5	1	15	33	26	27	2	2	1	139
03:00	10	20	6	1	0	0	5	11	20	22	10	6	1	6	118
04:00	6	2	1	0	0	0	2	4	8	19	8	8	6	1	65
05:00	3.	8	0	0	0	0	0	8	18	5	3	2	1	4	52
06:00	12	14	4	0	0	0	2	1	20	25	13	9	4	2	106
07:00	41	29	8	0	0	0	0	18	52	40	44	17	0	4	253
08:00	37	21	7	0	0	0	2	15	52	43	42	13	1	6	239
09:00	64	33	5	0	1	0	0	38	74	78	23	6	1	16	339
10:00	114	50	13	0	6	8	16	75	113	51	44	9	3	23	525
11:00	124	77	3	2	14	13	23	116	125	61	18	1	10	40	627
12:00	155	83	2	0	2	3	24	69	116	63	25	8	2	44	596
13:00	189	91	2	0	5	13	15	55	118	63	31	9	3	49	643
14:00	167	75	2	12	7	3	29	98	160	60	26	10	5	51	705
15:00	185	72	18	9	11	13	38	113	136	60	24	5	5	67	756
16:00	209	74	1	1	4	12	22	87	153	79	18	10	8	39	717
17:00	141	70	3	0	1	0	11	84	115	79	34	15	1	26	580
18:00	129	53	11	1	0	1	10	82	149	82	38	7	0	32	595
19:00	110	43	4	0	1	4	23	84	108	120	39	11	2	39	588
20:00	70	42	3	0	6	1	17	91	95	76	28	12	0	26	467
21:00	77	41	3	0	0	3	15	49	87	64	33	14	3	24	413
22:00	44	17	1	0	0	1	5	45	66	45	33	8	0	9	274
23:00	42	30	2	0	0	0	1	32	52	43	19	13	2	8	244
24:00	8	11	2	0	1	0	5	16	17	40	22	8	2	2	134
DAY TOTAL PERCENTS	1966 21.1%	979 10.5%	112 1.2%	27 0.3%	59 0.6%	80 0.9%	267 2.9%	1227 13.1%	1921 20.6%	1267 13.6%	622 6.7%	212 2.3%	63 0.7%	532 5.7%	9334 100.0%

Statistical Information...

15th Percentile Speed 17.1 mph

Median Speed 46.7 mph

10 MPH Pace Speed
40 mph to 50 mph
1921 vehicles in pace
Representing 28.1% of the total vehicles

85th Percentile Speed 54.5 mph

Average Speed 42.8 mph

Vehicles > 65 MPH 63 0.9%

Page: 8 Mon 10/3/2022

Station #: 220230000017 Site ID: 110000000101

Location: Rte.28 NB, S. of Skyline Trail Crossing

Direction: NORTH

Lane: 1

File: D0926002.prn City: Quincy

County: speed

TIME	<10	<15	<20	<25	<30	<35	< 40	< 45	<50	< 55	<60	<65	<70	<250	Total
01:00	12	5	1	0	0	0	4	8	27	18	6	12	1	4	98
02:00	6	2	0	0	0	0	0	1	6	18	8	2	1	3	47
03:00	1	4	1	0	0	0	0	1	8	8	4	5	0	1	33
04:00	0	6	1	0	0	0	0	4	4	10	6	2	0	2	35
05:00	23	11	0	0	0	0	0	9	16	17	28	15	6	4	129
06:00	170	55	12	0	0	3	36	121	135	98	62	22	7	36	757
07:00	215	40	0	0	7	85	370	363	93	17	3	13	20	154	1380
08:00	236	36	0	0	16	91	407	352	51	6	1	14	26	171	1407
09:00	212	81	19	34	49	86	180	228	116	36	12	12	12	94	1171
10:00	195	78	1	0	0	13	46	92	129	79	17	7	2	35	694
11:00	122	46	4	0	1	4	20	110	108	62	26	6	6	45	560
12:00	179	61	1	0	1	1	26	76	103	53	23	9	3	24	560
DAY TOTAL PERCENTS	1371	425 6.2%	40	34	74	283	1089 15.8%	1365 19.9%	796 11.6%	422 6.1%	196 2.9%	119 1.7%	84 1.2%	573 8.3%	6871 100.0%
FERCENTS	20.00	0.28	0.00	0.58	T • T 2	4.10	13.03	19.96	TT.00	0.10	2.90	1.75	1.25	0.36	100.0%

Statistical Information...

15th Percentile Speed 32.9 mph

Median Speed 41.9 mph

10 MPH Pace Speed 35 mph to 45 mph 1365 vehicles in pace Representing 27.7% of the total vehicles 85th Percentile Speed 51.0 mph

Average Speed 40.8 mph

Vehicles > 65 MPH 84 1.7%

SPEED SUMMARY Tue 9/27/2022

5TA.15B

Station #: 220230000033

Site ID: 110000000102

Location: Rte.28 SB, S. of Skyline Trail Crossing

Direction: SOUTH

Lane: 1

File: D0927002.prn City: Quincy County: speed

TIME	<10	<15	<20	<25	<30	<35	<40	< 45	<50	<55	<60	<65	<70	<250	Total
15:00	216	44	11	27	82	89	97	135	62	18	14	3	2	52	852
16:00	135	21	46	89	287	413	253	36	11	3	1	5	6	63	1369
17:00	157	25	43	78	206	429	270	61	9	0	2	13	13	78	1384
18:00	157	17	18	44	193	367	350	85	8	2	5	6	17	132	1401
19:00	122	44	6	13	131	275	298	127	32	9	1	9	6	134	1207
20:00	116	42	0	0	6	40	116	120	80	29	8	2	3	111	673
21:00	85	38	3	1	0	7	52	.107	99	31	11	5	1	68	508
22:00	36	35	1	0	6	14	32	80	99	42	7	3	0	48	403
23:00	47	31	9	0	0	6	27	63	61	46	14	3	2	. 52	361
24:00	25	28	13	2	1	4	32	41	56	37	21	8	0	32	300
DAY TOTAL PERCENTS	1096 13.0%	325 3.8%	150 1.8%	254 3.0%	912 10.8%	1644 19.4%	1527 18.1%	855 10.1%	517 6.1%	217	84 1.0%	57 0.7%	50 0.6%	770 9.1%	8458 100.0%

Statistical Information...

15th Percentile Speed 26.4 mph

Median Speed 35.0 mph

10 MPH Pace Speed
25 mph to 35 mph
1644 vehicles in pace
Representing 24.9% of the total vehicles

85th Percentile Speed 44.6 mph

Average Speed 35.2 mph

Vehicles > 65 MPH 50 0.8%

Page: 2

Station #: 220230000033

Site ID: 11000000102

Location: Rte.28 SB, S. of Skyline Trail Crossing

Direction: SOUTH

Lane: 1

File: D0927002.prn City: Quincy County: speed

TIME <10 <15 <20 <25 <30 <35 <40 <45 <50 <55 <60 <65 <70 <250 Total \_\_\_\_\_\_ 01:00 15 12 2 0 0 0 1 14 31 28 17 14 13 149 02:00 3 5 6 3 3 4 4 2 1 0 2 10 15 8 0 1 1 5 10 6 0 0 0 6 5 3 2 1 0 0 59 0 12 1 0 2 4 0 4 3 0 5 3 0 5 03:00 7 6 4 9 1 0 7 43 0 04:00 6 5 3 8 7 12 37 50 2 05:00 0 0 0 2 3 ± 2 11 11 0 2 7 9 32 14 9 3 1 2 15 53 42 31 18 13 4 8 88 98 70 41 24 11 06:00 5 3 111 0 07:00 57 34 6 2 30 304 52 3 08:00 122 0 1 47 569 14 113 96 114 106 9 1 3 1 09:00 122 42 3 5 45 94 28 13 90 675 8 66 145 39 0 1 10:00 3 22 12 70 587 4 154 36 0 1 52 11:00 4 97 58 14 16 56 498 6 12:00 152 38 0 0 8 12 87 100 47 2 25 56 535 34 6 57 5 61 15 147 13:00 11 14 23 84 108 69 23 5 4 2 70 600 10 37 33 52 42 82 104 126 115 75 24 112 76 22 14 10 9 2 80 6 3 78 11 15 84 14:00 132 52 712 200 15:00 870 3 2 160 34 11 95 269 361 62 21 4 16:00 227 1357 1 9 21 113 1409 9 17:00 2 9 21 113 1409 8 12 29 159 1372 2 8 21 153 1226 14 6 7 99 707 4 2 2 62 471 23 9 0 37 380 16 2 3 48 411 1 4 18:00 184 25 30 38 141 321 334 86 4 1 12 120 286 306 33 70 15 19:00 195 23 85 0 2 17 0 4 F 106 68 95 90 18 1 20:00 103 42 133 31 74 47 21:00 44 5 28 0 70 69 **44** 44 47 22:00 23:00 24:00 38 36 3 0 0 5 36 108 79 37 16 52 20 2 0 0 3 18 60 71 44 18 4 30 324 DAY TOTAL 2296 730 115 278 851 1675 2249 1688 1165 485 253 147 121 1403 13456 PERCENTS 17.1% 5.4% 0.9% 2.1% 6.3% 12.4% 16.7% 12.5% 8.7% 3.6% 1.9% 1.1% 0.9% 10.4% 100.0%

Statistical Information...

15th Percentile Speed 27.0 mph

Median Speed 37.7 mph

10 MPH Pace Speed
30 mph to 40 mph
2249 vehicles in pace
Representing 23.1% of the total vehicles

85th Percentile Speed 48.0 mph

Average Speed 37.3 mph

Vehicles > 65 MPH 121 1.2%

#### SPEED SUMMARY Thu 9/29/2022

Page: 3

Station #: 220230000033

Site ID: 110000000102

Location: Rte.28 SB, S. of Skyline Trail Crossing

Direction: SOUTH

Lane: 1

File: D0927002.prn City: Quincy County: speed

TIME <10 <15 <20 <25 <30 <35 <40 <45 <50 <55 <60 <65 <70 <250 Total \_\_\_\_\_ 01:00 11 17 2 0 0 0 10 17 41 26 5 1 21 02:00 0 4 5 03:00 04:00 06:00 5 3 0 06:00 12 14 0 07:00 45 15 3 08:00 108 52 4 6 3 72 633 4 3 72 647 3 3 96 593 12 1 100 513 2 0 71 574 108 52 4 0 120 25 5 3 105 47 0 9 0 11 91 144 88 40 14 14 73 129 15 29 52 3 15 41 35 3 1 7 14 15 104 57 147 75 10:00 147 75 11 77 57 14 136 47 2 1 11:00 12:00 147 41 0 39 68 93 76 25 10 
 160
 48
 0
 0
 4
 25
 60

 157
 53
 3
 0
 5
 24
 87

 212
 56
 4
 0
 12
 53
 165

 238
 33
 2
 20
 94
 250
 372
 13:00 4 25 60 114 91 15 17 1 89 625 15 17 1 1 89 625 30 11 3 6 69 652 13 3 5 4 116 845 4 0 6 15 150 1337 2 4 5 13 147 1383 0 0 4 20 190 1357 0 2 6 9 127 1371 12 8 1 5 130 950 31 7 3 4 72 597 36 15 5 1 41 401 30 20 6 3 27 370 42 19 1 0 33 126 78 30 11 133 69 13 3 134 19 4 0 14:00 0 12 53 165 133 69 13 3 20 94 250 372 134 19 4 0 3 90 283 415 142 20 2 4 15:00 16:00 230 29 0 17:00 4 31 88 264 364 146 9 19 72 200 361 390 63 8 18:00 201 36 19:00 100 14 19 72 200 361 390 63 119 40 0 4 49 49 1 1 3 37 3 0 2 209 125 51 12 149 78 31 20:00 197 
 197
 209
 125
 51
 12
 8
 1

 21
 96
 149
 78
 31
 7
 3

 8
 30
 104
 85
 36
 15
 5

 3
 25
 78
 112
 30
 20
 6
 21:00 82 21 34 37 22:00 23:00 35 28 24:00 33 16 35 28 2 0 2 0 3 32 87 83 42 18 1 0 33 350 DAY TOTAL 2300 702 61 148 583 1668 2658 2086 1219 448 200 106 100 1682 13961 PERCENTS 16.5% 5.0% 0.4% 1.1% 4.2% 11.9% 19.0% 14.9% 8.7% 3.2% 1.4% 0.8% 0.7% 12.0% 100.0%

Statistical Information...

15th Percentile Speed 30.0 mph

Median Speed 38.4 mph

10 MPH Pace Speed
30 mph to 40 mph
2658 vehicles in pace
Representing 26.6% of the total vehicles

85th Percentile Speed 47.4 mph

Average Speed 37.9 mph

Vehicles > 65 MPH 100 1.0%

#### SPEED SUMMARY Fri 9/30/2022

Station #: 220230000033 File: D0927002.prn Site ID: 110000000102

Location: Rte.28 SB, S. of Skyline Trail Crossing Direction: SOUTH

Lane: 1

City: Quincy County: speed

TIME	<10	<15	<20	<25	<30	<35	<40	< 45	<50	<55	<60	<65	<70	<250	Total
0.1 0.0	10						_								
01:00	12	7	0	0	0	1	5	18	44	28	13	4	1	5	138
02:00	4	5	3	0	2	0	1	9	23	10	8	3	3	2	73
03:00	2	3	1	0	0	0	3	4	10	7	13	6	1	1	51
04:00	4	4	1	0	0	0	0	4	6	3	6	6	Ţ	1	36
05:00	1	2	Ţ	0	0	2	1	2	8	4	9	12	0	4	46
06:00	14	14	0	2	0	1	7	14	13	14	11	9	3	2	104
07:00	38	30	6	0	0	1	15	50	57	32	18	13	0	11	271
08:00	115	38	3	3	9	8	48	140	109	36	20	6	0	43	578
09:00	151	42	2	0	8	62	131	164	96	23	8	4	4	89	784
10:00	123	48	7	0	2	12	67	112	110	31	13	0	3	64	592
11:00	139	50	0	0	16	19	62	125	95	48	12	1	0	49	616
12:00	150	75	0	4	14	15	67	105	70	36	16	4	0	77	633
13:00	143	72	2	0	6	47	74	140	73	15	0	1	2	87	662
14:00	146	62	0	4	8	35	96	117	76	21	16	2	1	58	642
15:00	240	49	35	22	72	134	131	119	54	22	8	3	6	96	991
16:00	242	37	4	29	83	185	284	175	40	17	2	6	7	166	1277
17:00	251	36	0	12	80	196	320	158	22	1	7	10	15	222	1330
18:00	195	45	11	28	98	253	364	148	24	6	2	5	5	176	1360
19:00	152	40	0	24	66	124	199	166	42	12	3	4	9	149	990
20:00	89	36	7	7	16	55	137	118	89	12	6	2	0	80	654
21:00	65	48	0	0	4	8	78	139	86	27	10	2	2	57	526
22:00	58	36	1	1	0	3	40	111	79	36	13	1	0	57	436
23:00	49	29	0	1	1	34	5 <b>4</b>	88	79	25	14	4	1	37	416
24:00	29 	27	2	1	5	18	40	111	71	42	12	4	0	24	386
DAY TOTAL	2412	835	86	138	490	1213	2224	2337	1376	508	240	112	64	1557	13592
PERCENTS	17.7%	6.1%	0.6%	1.0%	3.6%	8.9%	16.4%	17.2%	10.1%	3.7%	1.8%	0.8%	0.5%	11.5%	100.0%

Statistical Information...

15th Percentile Speed 28.9 mph

Median Speed 39.6 mph

10 MPH Pace Speed 35 mph to 45 mph 2337 vehicles in pace Representing 24.3% of the total vehicles 85th Percentile Speed 48.1 mph

Average Speed 38.2 mph

Vehicles > 65 MPH 64 0.7%

#### Mass Highway Department

#### SPEED SUMMARY Sat 10/1/2022

Station #: 220230000033 File: D0927002.prn
Site ID: 110000000102 City: Quincy
Location: Rte.28 SB, S. of Skyline Trail Crossing County: speed

Direction: SOUTH

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	<40	< 45	<50	<55	<60	<65	<70	<250	Total
01:00	20	12	2	0	0	0	17	37	51	39	26	11	0	13	228
02:00	9	15	4	0	0	0	7	22	30	20	17	4	2	3	133
03:00	9	12	2	0	1	1	2	14	16	15	14	8	3	6	103
04:00	2	6	2	0	0	0	2	10	24	17	11	6	1	7	88
05:00	3	8	1	1	0	0	3	7	17	7	15	7	3	2	74
06:00	1	9	4	0	0	5	10	10	19	15	10	2	0	4	89
07:00	14	14	2	0	0	1	9	30	25	26	27	7	0	8	163
08:00	43	29	4	0	1	2	13	61	113	41	27	9	0	21	364
09:00	61	43	3	0	0	4	23	90	128	35	17	14	0	47	465
10:00	72	30	1	0	3	28	83	121	93	21	10	3	0	43	508
11:00	88	47	2	1	5	19	87	149	93	37	6	2	1	50	587
12:00	117	39	0	0	11	17	87	172	102	24	13	1	4	98	685
13:00	118	37	1	1	7	165	236	191	63	20	9	6	10	110	974
14:00	134	. 59	16	8	26	49	126	152	108	43	26	5	4	103	859
15:00	147	52	0	0	7	14	66	166	121	36	7	4	4	74	698
16:00	117	62	1	4	6	31	75	152	135	32	18	3	2	103	741
17:00	103	77	0	2	23	27	53	133	123	41	17	2	0	62	663
18:00	127	68	5	0	0	6	41	87	123	48	21	5	0	71	602
19:00	106	41	3	0	8	13	56	119	103	28	13	3	4	59	556
20:00	85	50	3	0	0	15	95	98	79	27	11	5	0	72	540
21:00	65	42	1	0	1	6	47	100	94	22	13	2	2	43	438
22:00	54	36	2	0	0	8	.32	79	81	36	19	8	4	25	384
23:00	44	16	1	0	0	5	30	87	92	37	12	9	0	34	367
24:00	28	25	4	0	1	12	28	61	73	37	14	9	2	38	332
DAY TOTAL	1567	829	64	17	100	428	1228	2148	1906	704	373	135	46	1096	10641
PERCENTS	14.7%	7.8%	0.6%	0.2%	0.9%	4.0%	11.5%	20.2%	17.9%	6.6%	3.5%	1.3%	0.4%	10.3%	100.0%

Statistical Information...

15th Percentile Speed 32.2 mph

Median Speed 43.1 mph

10 MPH Pace Speed
35 mph to 45 mph
2148 vehicles in pace
Representing 26.9% of the total vehicles

85th Percentile Speed 50.4 mph

Average Speed 40.9 mph

Vehicles > 65 MPH 46 0.6%

File: D0927002.prn

City: Quincy

County: speed

# SPEED SUMMARY Sun 10/2/2022

Station #: 220230000033

Site ID: 11000000102

Location: Rte.28 SB, S. of Skyline Trail Crossing

Direction: SOUTH

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	<40	<45	<50	<55	<60	<65	<70	<250	Total
01:00	18	10	11	0	1	4	2	37	59	32	12	1	0	9	196
02:00	25	14	4	0	0	0	5	41	45	33	11	8	4	14	204
03:00	13	2	2	0	1	4	1	9	17	20	10	4	1	3	87
04:00	3	8	3	0	0	0	7	7	17	10	14	6	3	5	83
05:00	4	8	0	0	0	0	1	7	17	5	5	2	1	5	55
06:00	5	5	1	0	1	0	4	4	12	2	5	3	0	10	52
07:00	8	15	2	1	0	0	6	8	17	19	11	6	3	6	102.
08:00	13	30	7	0	1	0	1	25	47	51	32	12	1	15	235
09:00	38	30	4	0	1	0	7	40	78	47	19	3	1	26	294
10:00	70	40	4	0	1	9	15	42	83	60	32	2	3	18	379
11:00	67	41	5	4	7	31	56	117	75	22	10	7	2	62	506
12:00	98	49	3	2	15	30	41	96	87	46	17	7	1	55	547
13:00	115	52	0	4	6	20	65	99	90	34	21	9	5	72	592
14:00	136	60	5	8	35	28	78	116	83	31	13	3	3	84	683
15:00	115	72	4	4	19	63	89	134	56	31	10	4	1	91	693
16:00	112	72	10	12	10	31	46	121	133	42	20	5	2	67	683
17:00	93	51	2	0	0	11	64	101	117	49	19	8	0	62	577
18:00	87	54	8	0	5	8	34	102	103	53	24	12	4	53	547
19:00	78	32	1	0	1	21	59	104	87	27	9	5	- 0	47	471
20:00	60	32	5	0	6	4	31	106	87	47	15	8	2	47	450
21:00	48	30	1	0	0	20	51	86	97	40	15	8	1	30	427
22:00	40	40	3	0	1	11	30	89	82	35	7	3	1	32	374
23:00	18	21	1	0	0	2	15	57	65	35.	25	10	2	21	272
24:00	18	23	5	0	1	6	13	35	68	28	14	5	0	18	234
DAY TOTAL PERCENTS	1282 14.7%	791 9.0%	91	35 0.4%	112 1.3%	303 3.5%	721 8.2%	1583 18.1%	1622 18.6%	799 9.1%	370 4.2%	141 1.6%	41 0.5%	852 9.7%	8743 100.0%

Statistical Information...

15th Percentile Speed 28.3 mph

Median Speed 44.0 mph

10 MPH Pace Speed
40 mph to 50 mph
1622 vehicles in pace
Representing 24.5% of the total vehicles

85th Percentile Speed 52.3 mph

Average Speed 41.1 mph

Vehicles > 65 MPH 41 0.6%

#### SPEED SUMMARY Mon 10/3/2022

Station #: 220230000033
Site ID: 110000000102
Location: Rte.28 SB, S. of Skyline Trail Crossing
County: speed

Direction: SOUTH

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	<40	< 45	<50	<55	<60	<65	<70	<250	Total
												· <b>-</b>			
01:00	7	5	1	0	0	0	4	27	19	29	7	5	3	10	117
02:00	2	5	1	1	0	2	4	12	14	9	7	0	0	3	60
03:00	5	4	1	0	0	0	4	9	7	4	7	4	1	2	48
04:00	5	1	0	0	0	1	3	8	9	10	7	3	1	1	49
05:00	6	1	0	1	0	0	2	10	3	11	5	1	0	0	40
06:00	18	12	9	1	0	0	4	6	19	21	8	4	4	3	109
07:00	59	24	4	0	1	3	6	39	53	37	13	6	1	12	258
08:00	117	37	7	0	5	7	52	77	100	51	16	7	1	44	521
09:00	108	53	3	1	9	35	103	125	87	27	11	4	0	68	634
10:00	98	37	1	0	1	7	35	126	84	32	15	13	0	41	490
11:00	98	49	0	0	1	12	40	86	79	42	15	1	2	54	479
12:00	116	44	2	0	10	7	44	75	82	29	20	2	4	42	477
DAY TOTAL PERCENTS	639 19.5%	272 8.3%	29 0.9%	4 0.1%	27 0.8%	74	301 9.2%	600 18.3%	556 16.9%	302 9.2%	131 4.0%	50 1.5%	17 0.5%	280 8.5%	3282 100.0%

Statistical Information...

15th Percentile Speed 31.5 mph

Median Speed 44.0 mph

10 MPH Pace Speed
35 mph to 45 mph
600 vehicles in pace
Representing 25.4% of the total vehicles

85th Percentile Speed 52.4 mph

Average Speed 41.5 mph

Vehicles > 65 MPH 17 0.7%

# VEHICLE TRAVEL SPEED DATA Collected North of Skyline Trail Crossing



SPEED SUMMARY Tue 9/27/2022

STA, 2NB

Station #: 220230000138 Site ID: 110000000201

Location: Rte.28 NB, N. of Skyline Trail Crossing

Direction: NORTH

Lane: 1

File: D0927004.prn

City: Quincy County: speed

TIME	<10	<15	<20	<25	<30	<35	<40	< 45	<50	<55	<60	<65	<70	<250	Total
16:00	190	3.1	44	59	89	154	97	62	150	97	30	8	2	29	1042
17:00	160	30	3	0	1	0	11	63	155	153	96	26	0	87	785
18:00	190	11	0	0	0	0	5	82	186	148	65	27	3	88	805
19:00	167	8	5	1	0	14	84	178	227	96	61	20	1	94	956
20:00	73	11	1	1	2	0	5	31	80	113	74	29	1	74	495
21:00	42	8	4	0	0	0	2	18	55	78	101	30	4	47	389
22:00	40	12	9	0	0	0	0	14	40	57	66	32	10	36	316
23:00	28	7	2	0	0	0	1	3	34	41	38	31	17	19	221
24:00	13	4	1	0	1	0	1	2	14	35	28	23	8	20	150
DAY TOTAL PERCENTS	903 17.5%	122	69 1.3%	61 1.2%	93 1.8%	168 3.3%	206	453 8.8%	941 18.2%	818 15.9%	559 10.8%	226 4.4%	46 0.9%	494	5159 100.0%

Statistical Information...

15th Percentile Speed 36.3 mph

Median Speed 48.8 mph

10 MPH Pace Speed 40 mph to 50 mph 941 vehicles in pace Representing 25.0% of the total vehicles 85th Percentile Speed 57.4 mph

Average Speed 46.8 mph

Vehicles > 65 MPH 46 1.2%

### SPEED SUMMARY

Page: 2 Wed 9/28/2022

Station #: 220230000138 File: D0927004.prn Site ID: 110000000201 City: Quincy Location: Rte.28 NB, N. of Skyline Trail Crossing County: speed

Direction: NORTH

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	<40	<45	<50	<55	<60	<65	<70	<250	Total
01.00	1	2	0	0	0	0	1	1	7	1.0	1.5				
01:00	1	2	0	0	0	0	1	1	7	10	15	8	5	7	57
02:00	4	2	Ţ	0	0	C	4	3	2	3	6	5	3	5	38
03:00		0	0	0	0	0	0	0	5	8	10	5 7	0	0	29
04:00	3	3	0	0	0	0	0	1	0	5	6	,	2	4	31
05:00	14	6	0	0	0	0	1	0	6	21	24	32	12	20	136
06:00	145	19	4	0	0	3	33	96	165	149	128	62	11	55	870
07:00	203	2	0	0	1	14	209	539	261	34	2	3	1	91	1360
08:00	221	4	Ţ	0	4	61	311	486	185	11	1	4	0	77	1366
09:00	235	5	0	1	0	1	96	507	301	46	3	1	2	94	1292
10:00	232	13	0	Ţ	0	9	24	233	305	97	21	29	11	83	1058
11:00	231	11	Ţ	0	0	2	24	138	279	162	67	18	2	57	992
12:00	174	14	2	0	1	0	7	64	166	97	84	21	7	43	680
13:00	165	18	1	0	1	5	21	64	128	109	61	23	2	25	623
14:00	167	29	2	0	0	2	16	63	193	106	67	20	4	37	706
15:00	282	19	0	0	0	12	36	80	157	114	74	21	4	75	874
16:00	243	14	1	0	0	0	6	62	164	114	39	21	0	68	732
17:00	210	19	2	0	1	5	26	91	148	118	52	19	10	80	781
18:00	171	49	122	180	174	79	33	50	97	66	39	6	3	61	1130
19:00	152	41	58	47	84	77	38	89	145	85	50	18	5	87	976
20:00	101	10	2	0	0	4	17	51	96	99	87	24	0	57	548
21:00	67	10	1	0	0	1	9	18	63	89	80	43	5	32	418
22:00	32	12	3	0	0	0	6	16	52	62	78	29	6	28	324
23:00	18	12	4	0	0	3	7	15	41	35	54	30	5	28	252
24:00	9	8	4	0	0	0	6	13	30	38	14	21	3	13	159
DAY TOTAL PERCENTS	3081 20.0%	322 2.1%	209	229 1.5%	266 1.7%	278 1.8%	931 6.0%	2680 17.4%	2996 19.4%	1678 10.9%	1062 6.9%	470 3.0%	103 0.7%	1127	15432 100.0%

Statistical Information...

15th Percentile Speed 37.0 mph

Median Speed 46.2 mph

10 MPH Pace Speed 40 mph to 50 mph 2996 vehicles in pace Representing 26.7% of the total vehicles 85th Percentile Speed 54.9 mph

Average Speed 45.1 mph

Vehicles > 65 MPH 103 0.9%

#### Mass Highway Department

#### SPEED SUMMARY Thu 9/29/2022

Station #: 220230000138 File: D0927004.prn
Site ID: 110000000201 City: Quincy
Location: Rte.28 NB, N. of Skyline Trail Crossing County: speed

Direction: NORTH

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	<40	< 45	<50	<55	<60	<65	<70	<250	Total
01:00	1	2	0	0	0	2	0	3	18	9	14	16	0	14	79
02:00	2	4	0	0	0	0	3	2	12	5	8	6	1	3	46
03:00	0	2	0	0	0	0	2	3	4	4	4	7	3	1	30
04:00	0	0	0	0	0	0	0	3	3	2	6	11	2	9	36
05:00	9	14	1	0	0	0	0	8	12	25	30	41	9	21	170
06:00	120	24	2	0	0	0	9	57	173	161	110	69	12	62	799
07:00	168	6	0	1	10	29	291	550	217	33	13	3	0	76	1397
08:00	135	19	44	69	175	188	284	393	81	6	0	6	5	63	1468
09:00	228	7	2	12	37	76	218	446	185	15	1	3	1	84	1315
10:00	201	18	8	8	22	58	105	242	206	80	30	5	7	98	1088
11:00	185	9	0	4	13	6	40	93	187	104	43	30	3	78	795
12:00	160	13	1	4	21	16	15	76	105	112	70	11	3	34	641
13:00	148	20	3	0	0	1	16	37	146	149	66	40	0	63	689
14:00	155	15	1	2	0	6	28	48	114	104	100	54	5	64	696
15:00	221	38	2	0	0	0	20	124	173	136	48	10	0	66	838
16:00	227	23	4	0	0	11	23	94	247	139	61	19	0	75	923
17:00	188	33	49	67	59	26	32	92	133	108	63	24	4	60	938
18:00	158	25	6	0	0	0	4	75	211	146	100	21	2	102	850
19:00	146	16	2	0	0	0	23	90	159	115	72	29	6	110	768
20:00	70	6	1	0	1	6	12	52	130	125	54	25	2	43	527
21:00	40	20	3	0	0	0	8	30	79	73	67	29	10	51	410
22:00	13	15	3	0	2	0.	0	9	59	104	60	21	5	28	319
23:00	20	11	2	0	0	0	3	21	49	45	56	29	7	45	288
24:00	13	2	2	0	0	0	0	8	25	37	35	15	10	9	156
DAY TOTAL	2608	342	136	167	340	425	1136	2556	2728	1837	1111	524	97	1259	15266
PERCENTS	17.1%	2.2%	0.9%	1.1%	2.2%	2.8%	7.4%	16.7%	17.9%	12.0%	7.3%	3.4%	0.6%	8.2%	100.0%

Statistical Information...

15th Percentile Speed 36.3 mph

Median Speed 46.1 mph

10 MPH Pace Speed
40 mph to 50 mph
2728 vehicles in pace
Representing 23.9% of the total vehicles

85th Percentile Speed 55.1 mph

Average Speed 45.1 mph

Vehicles > 65 MPH 97 0.9%

#### SPEED SUMMARY Fri 9/30/2022

County: speed

Station #: 220230000138 File: D0927004.prn
Site ID: 110000000201 City: Quincy

Location: Rte.28 NB, N. of Skyline Trail Crossing

Direction: NORTH

Lane: 1

TIME .	<10	<15	<20	<25	<30	<35	<40	<45	<50 	<55	<60	<65	<70	<250	Total
01:00	4	1	0	0	0	0	0	4	11	19	28	8	2	10	87
02:00	2	0	0	0	0	0	1	1	11	4	10	5	c 5	4	43
03:00	2	2	0	0	0	0	0	1	8	11	14	11	5	4	58
04:00	4	1	0	0	0	0	0	1	8	9	5	4	3	6	41
05:00	5	6	0	0	0	0	1	0	8	30	33	14	13	15	125
06:00	86	33	1	0	0	0	2	48	167	121	111	84	16	57	726
07:00	172	5	0	0	0	26	176	524	276	50	17	2	4	110	1362
08:00	193	2	0	0	1	29	265	556	233	34	5	1	4	86	1409
09:00	165	12	0	0	0	17	73	198	229	164	77	9	1	92	1037
10:00	157	19	1	0	0	2	21	70	166	170	107	33	2	97	845
11:00	136	18	1	0	0	0	0	28	147	138	8.9	23	5	73	658
12:00	138	10	0	0	0	3	6	65	133	126	127	36	2	46.	692
13:00	147	7	2	0	0	11	17	85	170	119	96	26	6	66	752
14:00	279	33	8	0	0	17	57	132	206	98	63	12	1	61	967
15:00	221	25	28	22	82	97	139	183	158	67	25	17	3	64	1131
16:00	167	79	104	100	91	36	48	101	94	115	51	12	2	52	1052
17:00	191	84	114	158	103	29	22	71	103	56	32	16	3	47	1029
18:00	148	67	88	169	144	62	50	100	92	69	30	7	2	65	1093
19:00	132	27	37	53	23	81	233	335	181	44	13	10	1	114	1284
20:00	123	16	14	23	49	77	125	172	143	81	43	13	6	49	934
21:00	55	17	3	0	0	0	3	16	59	94	94	49	6	43	439
22:00	35	12	2	0	0	1	5	14	72	75	71	34	11	36	368
23:00	34	13	3	0	0	0	0	9	94	69	103	46	8	31	410
24:00	8	10	1	0	0	0	0	2	39	35	54	39	9	26	223
DAY TOTAL PERCENTS	2604 15.5%	499 3.0%	407 2.4%	525 3.1%	493	488	1244	2716 16.2%	2808 16.7%	1798 10.7%	1298 7.7%	511 3.0%	120 0.7%	1254 7.5%	16765 100.0%

Statistical Information...

15th Percentile Speed 30.1 mph

Median Speed 45.2 mph

10 MPH Pace Speed
40 mph to 50 mph
2808 vehicles in pace
Representing 21.8% of the total vehicles

85th Percentile Speed 55.0 mph

Average Speed 43.3 mph

Vehicles > 65 MPH 120 0.9%

#### Mass Highway Department

## SPEED SUMMARY

Page: 5 Sat 10/1/2022

Station #: 220230000138 File: D0927004.prn Site ID: 110000000201 City: Quincy Location: Rte.28 NB, N. of Skyline Trail Crossing County: speed

Direction: NORTH

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	<40	<45	<50	<55	<60	<65	<70	<250	Total
01:00	5	5	1	0	0	0	0	4	14	22	32	21	6	13	123
02:00	6	3	1	Ô	0	0	0	10	21	17	23	12	3	15	111
03:00	2	4	0	0	0	0	0	10	9	7	16	10	2	10	70
04:00	0	.3	3	0	0	0	0	2	2	11	13	9	4	6	53
05:00	1	1	0	0	0	1	1	1	6	6	11	13	6	14	61
06:00	13	3	2	1	0	2	0	6	9	24	39	22	10	17	148
07:00	34	15	1	0	0	0	2	18	38	89	72	65	11	34	379
08:00	40	17	5	0	0	0	8	12	44	83	72	44	9	42	376
09:00	60	16	0	0	0	1	4	41	95	116	102	32	3	38	508
10:00	85	11	2	0	0	2	15	90	174	96	45	26	11	75	632
11:00	100	7	0	0	0	1	25	56	159	134	73	27	2	70	654
12:00	130	17	1	0	0	3	14	58	183	150	97	11	2	72	738
13:00	122	15	0	0	0	0	8	76	187	163	69	11	5	86	742
14:00	134	18	2	0	Q	0	9	46	131	168	98	51	5	79	741
15:00	158	16	2	3	1	3	28	80	156	169	94	35	1	73	819
16:00	139	17	2	0	0	0	1	14	135	182	109	32	8	88	727
17:00	129	22	3	0	0	2	13	37	128	139	108	50	3	63	697
18:00	142	18	2	0	2	7	12	50	104	131	93	42	10	73	686
19:00	100	18	3	0	0	0	0	39	123	140	108	32	3	93	659
20:00	76	11	1	0	0	0	0	58	127	124	74	32	3	51	557
21:00	88	12	3	0	0	0	7	45	97	129	89	35	12	70	587
22:00	41	13	2	0	1	0	2	34	61	80	61	31	4	51	381
23:00	35	12	2	0	0	0	7	16	67	74	64	28	4	49	358
24:00	13 	7	2	0	0	0	2	8	33	43	55 	38	7	38 <b>-</b>	246
DAY TOTAL	1653	281	40	4	4	22	158	811	2103	2297	1617	709	134	1220	11053
PERCENTS	15.0%	2.5%	0.4%	0.0%	0.0%	0.2%	1.4%	7.3%	19.0%	20.8%	14.6%	6.4%	1.2%	11.0%	100.0%

Statistical Information...

15th Percentile Speed 44.4 mph

Median Speed 51.5 mph

10 MPH Pace Speed 45 mph to 55 mph 2297 vehicles in pace Representing 28.1% of the total vehicles 85th Percentile Speed 58.8 mph

Average Speed 50.4 mph

Vehicles > 65 MPH 134 1.6%

Page: 6

Station #: 220230000138

Site ID: 110000000201

Location: Rte.28 NB, N. of Skyline Trail Crossing

Direction: NORTH

Lane: 1

File: D0927004.prn City: Quincy County: speed

TIME	<10	<15	<20	<25	<30	<35	< 40	<45	<50	<55	<60 .	<65	<70	<250	Total
	- <b></b>														
01:00	16	9	1	0	0	0	1	13	18	21	22	29	9	27	166
02:00	9	7	2	0	0	0	0	7	15	36	23	18	8	16	141
03:00	6	5	0	0	0	0	0	6	13	15	25	19	10	25	124
04:00	1	4	2	0	0	0	1	0	6	6	21	12	3	14	70
05:00	2	0	0	0	Ó	0	1	3	9	8	. 6	5	5	13	52
06:00	6	8	3	0	0	0	6	1	14	17	25	16	2	9	107
07:00	14	14	1	0	0	0	4	4	32	44	62	50	9	29	263
08:00	13	12	4	0	0	0	0	5	20	45	71	36	11	36	253
09:00	34	11	1	0	0	1	4	20	38	75	75	43	7	42	351
10:00	68	16	4	0	0	1	11	16	79	103	102	85	7	57	549
11:00	107	15	5	0	0	3	3	44	119	133	111	54	3	58	655
12:00	94	25	9	0	0	0	4	21	89	120	138	56	11	60	627
13:00	120	19	0	0	0	0	6	33	103	145	125	48	17	88	704
14:00	140	36	2	0	1	6	7	24	97	122	129	55	9	80	708
15:00	153	28	4	0	0	3	8	61	159	149	88	35	5	86	779
16:00	124	24	2	0	0	2	25	62	136	127	138	51	6	73	770
17:00	108	40	7	0	3	0	4	18	81	120	114	54	2	63	614
18:00	93	28	9	0	0	5	1	29	79	153	122	46	6	54	625
19:00	102	15	6	0	1	0	12	56	93	115	107	51	6	62	626
20:00	64	17	4	0	0	1	5	35	86	108	79	24	4	56	483
21:00	40	9	4	0	0	1	5	24	76	86	92	50	10	37	434
22:00	29	7	3	0	0	0	4	15	29	59	59	40	3	39	287
23:00	16	14	5	0	0	0	0	10	46	37	63	44	3	25	263
24:00	3	6	7	3	0	0	5	1	12	27	33	12	11	14	134
DAY TOTAL	1362	369	85	3	5	23	117	508	1449	1871	1830	933	167	1063	9785
PERCENTS	13.9%	3.8%	0.9%	0.0%	0.1%	0.2%	1.2%	5.2%	14.8%	19.1%	18.7%	9.5%	1.7%	10.9%	100.0%

Statistical Information...

15th Percentile Speed 45.0 mph

Median Speed 53.0 mph

10 MPH Pace Speed 45 mph to 55 mph

1871 vehicles in pace
Representing 25.4% of the total vehicles

85th Percentile Speed 60.0 mph

Average Speed 50.9 mph

Vehicles > 65 MPH 167 2.3%

Page: 7

Station #: 220230000138

Site ID: 110000000201

Location: Rte.28 NB, N. of Skyline Trail Crossing

Direction: NORTH

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	< 40	< 45	<50	<55	<60	<65	<70	<250	Total
_															
01:00	3	4	2	0	0	0	0	9	11	25	28	10	5	9	106
02:00	2	1	0	0	0	3	0	1	3	9	12	6	2	10	49
03:00	1	1	0	0	0	0	2	0	6	7	9	8	2	1	37
04:00	4	2	1	0	0	0	0	1	5	6	3	8	2	7	39
05:00	7	5	2	0	0	0	0	3	6	24	35	27	9	14	132
06:00	145	17	6	0	0	1	7	84	148	140	135	61	20	58	822
07:00	191	3	0	0	0	35	293	519	185	36	5	2	2	110	1381
08:00	187	4	0	0	5	44	303	544	157	10	1	3	3	105	1366
09:00	174	48	25	44	109	120	109	182	168	78	41	12	1	58	1169
10:00	124	13	2	1	1	9	22	59	153	142	116	30	4	69	745
11:00	118	21	2	0	0	. 0	10	29	111	100	76	44	4	53	568
12:00	105	17	4	0	0	0	3	33	133	90	115	37	4	70	611
13:00	95	13	1	2	0	3	7	26	109	115	121	22	4	40	558
DAY TOTAL PERCENTS	1156 15.2%	149	45 0.6%	47	115 1.5%	215	756 10.0%	1490 19.6%	1195 15.8%	782 10.3%	697 9.2%	270 3.6%	62 0.8%	604 8.0%	7583 100.0%

Statistical Information...

15th Percentile Speed 37.0 mph

Median Speed 45.4 mph

10 MPH Pace Speed
35 mph to 45 mph
1490 vehicles in pace
Representing 25.6% of the total vehicles

85th Percentile Speed 56.1 mph

Average Speed 45.4 mph

File: D0927004.prn

City: Quincy

County: speed

Vehicles > 65 MPH 62 1.1%

SPEED SUMMARY Tue 9/27/2022

5TA.2 5B

Station #: 220230000146

Site ID: 110000000202

Location: Rte.28 SB, N. of Skyline Trail Crossing

Direction: SOUTH

Lane: 1

File: D0926008.prn City: Quincy County: speed

TIME	<10	<15	<20	<25	<30	<35	< 40	<45	<50	<55	<60	<65	<70	<250	Total
01:00	23	6	5	0	2	2	11	22	29	28	36	7	3	13	187
02:00	12	1	0	4	0	0	6	9	11	23	10	7	1	5	89
03:00	4	1	0	0	0	3	0	11	6	18	6	7	2	10	68
04:00	1	8	0	0	0	0	8	7	14	2	17	1	1	13	72
05:00	27	6	0	0	0	0	12	5	19	21	20	17	0	43	170
06:00	368	6	7	1	20	0	4	14	9	3	41	15	17	27	532
07:00	518	19	4	3	0	10	2	20	31	17	8	8	0	31	671
08:00	463	23	2	3	3	0	10	25	33	24	17	1	0	25	629
09:00	514	12	15	2	0	4	47	55	23	13	4	2	4	29	724
10:00	490	26	3	5	1	8	33	44	81	8	15	1	1	35	751
11:00	346	24	3	8	8	2	23	81	89	52	10	8	3	60	717
12:00	364	38	2	2	8	3	8	124	108	43	21	3	0	37	761
13:00	397	37	1	1	7	22	52	100	70	22	10	3	1	13	736
14:00	342	18	4	1	2	0	37	92	83	56	18	9	2	51	715
15:00	193	18	6	0	30	58	118	199	147	42	26	11	0	51	899
16:00	121	61	84	73	209	355	337	106	2	2	0	11	5	28	1394
17:00	133	14	24	83	172	339	459	91	7	0	2	12	5	58	1399
18:00	144	5	0	8	82	351	529	118	4	3	7	7	22	122	1402
19:00	117	8	8	15	135	272	333	154	44	13	8	11	15	93	1226
20:00	87	13	2	0	0	59	104	148	108	44	13	10	6	107	701
21:00	57	25	3	0	1	4	57	102	108	42	31	12	2	92	536
22:00	36	11	3	0	5	5	17	99	80	53	31	5	1	62	408
23:00	22	19	1	0	0	1	13	59	90	57	24	9	3	60	358
24:00	21	10	2	0	0	0	15	53	62	39	25	27	10	41	305
DAY TOTAL	4800	409	179	209	685	1498	2235	1738	1258	625	400	204	104	1106	15450
PERCENTS	31.1%	2.6%	1.2%	1.4%	4.4%	9.7%	14.5%	11.2%	8.1%	4.0%	2.6%	1.3%	0.7%	7.2%	100.0%

Statistical Information. ..

15th Percentile Speed 29.6 mph

Median Speed 39.0 mph

10 MPH Pace Speed
30 mph to 40 mph
2235 vehicles in pace
Representing 23.4% of the total vehicles

85th Percentile Speed 49.6 mph

Average Speed 39.1 mph

Vehicles > 65 MPH 104 1.1%

#### Mass Highway Department

#### SPEED SUMMARY Wed 9/28/2022

Station #: 220230000146 File: D0926008.prn
Site ID: 110000000202 City: Quincy
Location: Rte.28 SB, N. of Skyline Trail Crossing County: speed

Direction: SOUTH

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	< 40	<45	<50 ,	<55	<60	<65	<70	<250	Total
											-				
01:00	2	4	2	0	0	0	0	10	37	29	29	12	0	28	153
02:00	3	1	1	0	0	0	0	9	15	7	6	5	2	13	62
03:00	1	0	0	0	0	1	1	2	9	10	13	3	1	2	43
04:00	1	1	1	0	0	0	0	1	4	10	4	4	1	10	37
05:00	0	2	1	0	0	0	2	4	13	7	11	6	1	7	54
06:00	2	6	4	0	2	2	0	12	25	14	19	7	9	15	117
07:00	25	18	4	0	0	1	10	45	60	46	31	20	3	65	328
08:00	84	25	3	0	1	10	23	121	94	73	46	13	5	103	601
09:00	100	30	8	0	1	10	68	156	126	42	22	11	2	109	685
10:00	128	26	1	0	1	6	48	112	135	63	20	20	1	38	599
11:00	100	27	5	0	0	7	26	123	129	47	30	3	4	39	540
12:00	95	42	2	1	0	2	65	122	115	61	32	10	1	30	578
13:00	125	28	3	1	12	19	68	134	101	68	30	12	0	21	622
14:00	144	27	6	0	1	24	68	142	145	.50	27	9	0	40	683
15:00	153	36	23	7	15	65	153	196	138	37	16	12	3	35	889
16:00	156	18	18	33	122	326	387	143	32	12	5	4	20	79	1355
17:00	122	6	4	31	213	408	384	132	3	5	5	8	16	108	1445
18:00	119	16	12	42	138	394	421	99	4	0	2	19	24	121	1411
19:00	125	12	0	17	133	337	328	95	26	11	9	9	35	106	1243
20:00	83	19	1	1	29	63	141	153	92	27	10	6	5	92	722
21:00	59	24	1	0	1	15	33	99	98	38	33	8	1	79	489
22:00	30	18	3	0	0	0	23	79	86	50	39	6	4	63	401
23:00	46	22	5	0	0	0	15	75	90	52	38	13	2	63	421
24:00	27	15	7	0	0	1	16	49	59	58	35	14	2	70	353
DAY TOTAL	1730	423	115	133	669	1691	2280	2113	1636	817	512	234	142	1336	13831
PERCENTS	12.5%	3.1%	0.8%	1.0%	4.8%	12.2%	16.5%	15.3%	TT.8%	5.9%	3.7%	1.7%	1.0%	9.7%	100.0%

Statistical Information...

15th Percentile Speed 30.8 mph

Median Speed 40.2 mph

10 MPH Pace Speed
30 mph to 40 mph
2280 vehicles in pace
Representing 21.2% of the total vehicles

85th Percentile Speed 50.6 mph

Average Speed 40.3 mph

Vehicles > 65 MPH 142 1.3%

#### SPEED SUMMARY Thu 9/29/2022

Station #: 220230000146 Site ID: 110000000202

Location: Rte.28 SB, N. of Skyline Trail Crossing

Direction: SOUTH

Lane: 1

File: D0926008.prn City: Quincy County: speed

TIME	<10	<15	<20	<25	<30	<35	<40	<45	<50	<55	<60	<65	<70	<250	Total
01:00	7	16	0	0	0	1	9	23	15	26	2.0	1.0	_	00	1.60
02:00	2	0	0	1	0	0	1	13	14	26 15	28 10	10 5	5	23	163
03:00	0	4	2	0	0	0	2	1	5	5	3	5 7	0 1	7	68
04:00	5	2	1	0	0	0	1	0	3	3	2	0	0	6	36
05:00	4	1	1	Ω	1	1	0	2	5	11	13	3	2	3	47
06:00	11	3	1	Ö	2	0	2	10	12	30	25	15	1	10	122
07:00	25	8	2	0	0	2	2	55	70	36	30	24	7	50	311
08:00	81	23	3	Ō	0	2	40	161	163	49	25	10	3	116	676
09:00	80	18	2	1	3	20	93	174	98	47	35	14	4	93	682
10:00	96	29	0	0	0	9	41	140	144	46	11	4	Ô	71	591
11:00	106	33	4	4	3	12	32	135	104	47	26	11	3	46	566
12:00	117	22	3	0	4	15	108	136	117	44	17	7	0	31	621
13:00	123	36	1	0	0	21	56	137	119	67	25	5	5	56	651
14:00	139	20	2	0	3	2	36	170	124	67	39	6	2	49	659
15:00	186	37	0	0	0	19	102	234	162	49	16	4	3	55	867
16:00	159	4	5	30	76	323	426	179	47	2	9	7	18	81	1366
17:00	141	8	8	3	66	327	538	171	12	1	3	13	19	128	1438
18:00	145	9	0	3	62	283	532	176	7	2	2	5	32	117	1375
19:00	76	8	8	43	260	427	395	61	1	6	4	10	16	82	1397
20:00	67	20	0	3	76	176	214	189	71	20	13	10	9	106	974
21:00	45	15	0	0	4	10	69	193	133	43	19	11	2	67	611
22:00	20	14	3	2	0	2	24	103	111	59	25	6	5	46	420
23:00	16	9	3	0	0	2	15	48	108	66	32	13	6	61	379
24:00	17 	13	2	0	0	1	24	84	72	55	36	12	5	43	364
DAY TOTAL PERCENTS	1668 11.6%	352 2.4%	51 0.4%	90 0.6%	560 3.9%	1655 11.5%	2762 19.2%	2595 18.0%	1717 11.9%	796 5.5%	448	212 1.5%	148 1.0%	1354	14408

Statistical Information...

15th Percentile Speed 32.0 mph

Median Speed 40.4 mph

10 MPH Pace Speed
30 mph to 40 mph
2762 vehicles in pace
Representing 24.3% of the total vehicles

85th Percentile Speed 49.7 mph

Average Speed 40.6 mph

Vehicles > 65 MPH 148 1.3%

#### SPEED SUMMARY Fri 9/30/2022

Station #: 220230000146 File: D0926008.prn
Site ID: 110000000202 City: Quincy
Location: Rte.28 SB, N. of Skyline Trail Crossing County: speed

Direction: SOUTH

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	<40	< 45	<50	<55	<60	<65	<70	<250	Total
01:00	7	3	2	0	0	0	1	17	33	26	40	6	0	7	142
02:00	0	0	3	0	1	0	2	4	17	26	9	5	2	6	75
03:00	1	3	1	0	0	1	1	1	15	6	8	9	2	5	53
04:00	2	1	2	0	0	0	0	2	8	4	4	8	1	6	38
05:00	1	2	0	0	0	0	0	5	12	3	6	9	1	3	42
06:00	7	2	3	0	1	0	1	10	18	23	13	12	5	16	111
07:00	23	12	2	0	0	4	13	35	39	57	39	21	6	39	290
08:00	76	15	9	0	0	0	23	148	132	79	35	14	2	82	615
09:00	112	23	0	0	1	30	111	243	124	40	19	10	3	96	812
10:00	115	37	4	0	0	0	67	124	101	54	28	10	4	96	640
11:00	99	32	3	0	0	0	49	123	149	72	39	9	0	71	646
12:00	132	22	2	0	0	8	60	155	156	72	18	6	3	39	673
13:00	112	28	1	0	5	21	64	202	151	45	8	0	2	57	696
14:00	140	47	3	0	7	9	53	151	127	48	22	5	2	35	649
15:00	197	41	15	23	40	95	173	197	90	37	22	7	15	94	1046
16:00	178	8	0	0	71	236	397	245	46	12	3	11	11	132	1350
17:00	158	12	5	20	94	313	466	160	18	7	4	11	19	136	1423
18:00	137	15	8	13	80	244	503	193	31	6	1	7	19	135	1392
19:00	99	11	2	0	19	88	315	249	82	14	1	2	14	93	989
20:00	52	11	1	0	7	73	152	155	101	36	20	7	4	70	689
21:00	40	22	2	0	0	3	52	185	106	52	19	3	1	56	541
22:00	33	9	1	0	0	3	20	128	97	46	33	13	1	62	446
23:00	31	16	1	0	0	11	56	55	107	48	34	14	2	63	438
24:00	25	13	3	0	0 -	3	21	98	84	53	33	15	2	45	395
DAY TOTAL PERCENTS	1777 12.5%	385 2.7%	73 0.5%	56 0.4%	326 2.3%	1142	2600 18.3%	2885	1844	866 6.1%	458 3.2%	214 1.5%	121	1444 10.2%	14191
L D V C D N 1 2	14.56	2.16	0.56	0.46	4.36	0.08	TO.32	20.38	13.08	0.12	٥.∠۶	⊥.5₹	0.98	TU.28	100.0%

Statistical Information...

15th Percentile Speed 33.5 mph

Median Speed 41.6 mph

10 MPH Pace Speed
35 mph to 45 mph
2885 vehicles in pace
Representing 26.3% of the total vehicles

85th Percentile Speed 50.1 mph

Average Speed 41.4 mph

Vehicles > 65 MPH 121 1.1%

## SPEED SUMMARY

Page: 6 Sat 10/1/2022

Station #: 220230000146 File: D0926008.prn Site ID: 110000000202 City: Quincy Location: Rte.28 SB, N. of Skyline Trail Crossing County: speed

Direction: SOUTH

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	<40	< 45	<50	<55	<60	<65	<70	<250	Total
01:00	7	6	2	0	0	0	10	24	49	41	36	20	7	32	234
02:00	6	8	3	2	0	0	3	15	27	19	25	10	2	22	142
03:00	5	2	0	0	0	1	2	12	11	10	21	21	5	17	107
04:00	4	1	0	1	0	0	4	11	23	12	18	2	1	14	91
05:00	5	4	1	0	0	0	1	3	14	6	13	18	2	8	75
06:00	2	4	3	0	0	1	3	13	8	20	14	5	0	16	89
07:00	7	9	2	0	0	2	4	20	29	17	23	20	0	38	171
08:00	32	10	2	2	0	0	5	46	77	74	50	19	8	53	378
09:00	3,6	21	2	0	0	0	12	102	104	79	32	15	1	94	498
10:00	41	13	3	2	2	23	66	150	114	28	15	4	2	53	516
11:00	52	13	4	1	2	6	57	183	148	54	27	8	0	64	619
12:00	91	21	2	0	5	21	64	176	144	53	18	4	3	88	690
13:00	88	18	0	0	17	81	276	285	84	34	15	7	5	100	1010
14:00	132	28	2	0	2	22	121	203	164	50	21	11	8	112	876
15:00	120	26	1	0	0	7	65	176	131	44	27	7	1	98	703
16:00	102	25	3	1	0	7	66	190	160	72	15	14	2	113	770
17:00	90	29	5	0	0	6	64	124	163	44	25	11	4	123	688
18:00	96	41	1	0	0	0	30	112	126	67	54	11	4	96	638
19:00	71	29	1	0	0	5	33	163	129	44	19	9	0	78	581
20:00	50	17	2	0	5	14	64	149	104	47	25	9	1	77	564
21:00	35	24	2	2	0	7	41	119	102	44	21	8	3	57	465
22:00	42	14	3	0	0	0	28	93	98	47	26	5	3	52	411
23:00	43	15	5	0	0	0	20	91	65	45	31	8	2	61	386
24:00	30	13	2	0	0	1	16	49	64	48	30	22	1	56	332
DAY TOTAL PERCENTS	1187 10.8%	391 3.5%	51 0.5%	11 0.1%	33 0.3%	204 1.8%	1055 9.6%	2509 22.7%	2138 19.4%	999	601 5.4%	268 2.4%	65 0.6%	1522 13.8%	11034 100.0%

Statistical Information.

15th Percentile Speed 37.7 mph

Median Speed 44.8 mph

10 MPH Pace Speed 35 mph to 45 mph 2509 vehicles in pace Representing 30.1% of the total vehicles 85th Percentile Speed 53.4 mph

Average Speed 44.4 mph

Vehicles > 65 MPH 65 0.8%

#### SPEED SUMMARY Sun 10/2/2022

Station #: 220230000146 File: D0926008.prn
Site ID: 110000000202 City: Quincy
Location: Rte.28 SB, N. of Skyline Trail Crossing County: speed

Direction: SOUTH

Lane: 1

TIME	<10	<15	<20	<25	<30	<35	< 40	< 45	<50	<55	<60	<65	<70	<250	Total
01:00	8	15	6	2	0	4	5	16	36	34	30	15	2	33	206
02:00	9	13	5	1	0	0	8	26	38	31	22	17	2	36	208
03:00	3	4	2	1	0	0	9	4	8	18	12	16	0	11	88
04:00	3	5	0	Ô	0	1	0	9	15	13	13	4	5	16	84
05:00	4	1	0	Ω	1	0	0	10	5	7	7	9	4	7	55
06:00	2	2	1	Ô	0	0	2	8	14	13	1	7	0	Ó	50
07:00	10	6	3	0	0	0	3	11	12	6	18	4	1	24	98
08:00	24	16	2	0	0	0	6	18	34	29	52	11	8	47	247
09:00	26	20	0	0	0	0	15	22	79	44	28	13	5	51	303
10:00	37	27	4	0	0	1	14	40	.67	71	52	16	5	79	413
11:00	60	22	3	0	0	3	38	110	119	54	23	12	3	86	533
12:00	89	41	3	0	0	1	32	73	112	69	40	8	2	77	547
13:00	91	40	3	1	0	4	25	113	145	67	29	7	1	103	629
14:00	129	49	2	0	1	5	35	131	123	62	21	20	2	93	673
15:00	117	35	1	0	1	7	42	165	100	59	26	21	3	94	671
16:00	94	50	3	0	0	2	22	146	143	72	33	17	. 4	108	694
17:00	56	43	8	0	1	6	33	107	110	82	39	21	1	105	612
18:00	61	38	5	1	3	3	9	106	126	70	56	17	12	68	575
19:00	50	21	3	2	1	12	62	82	111	54	25	8	1	71	503
20:00	46	20	4	0	1	5	27	88	99	62	28	10	3	65	458
21:00	53	17	0	0	0	3	32	80	96	65	27	8	2	55	438
22:00	23	11	4	0	0	2	17	74	99	46	35	11	4	73	399
23:00	24	11	3	0	0	0	13	42	50	45	54	14	4	31	291
24:00	18	9	3	0	0	1	23	20	52	38 	25	15	2	34	240
DAY TOTAL	1037	516	68	8	9	60	472	1501	1793	1111	696	301	76	1367	9015
PERCENTS	11.5%	5.7%	0.88	0.1%	0.1%	0.7%	5.2%	16.7%	19.9%	12.3%	7.7%	3.3%	0.8%	15.2%	100.0%

Statistical Information...

15th Percentile Speed 38.5 mph

Median Speed 46.9 mph

10 MPH Pace Speed
40 mph to 50 mph
1793 vehicles in pace
Representing 27.1% of the total vehicles

85th Percentile Speed 55.6 mph

Average Speed 45.2 mph

Vehicles > 65 MPH 76 1.1%

#### SPEED SUMMARY Mon 10/3/2022

Page: 8

Station #: 220230000146

Site ID: 110000000202

Location: Rte.28 SB, N. of Skyline Trail Crossing

Direction: SOUTH

Lane: 1

File: D0926008.prn City: Quincy

County: speed

TIME	<10	<15	<20	<25	<30	<35	<40	< 45	<50	<55	<60	<65	<70	<250	Total
01:00	6	4	3	0	0	0	0	5	22	26	22	7	1	23	119
02:00	3	1	0	1	1	2	2	7	18	6	10	4	1	9	65
03:00	1	1	0	1	0	0	5	5	7	5	6	11	1	4	47
04:00	2	3	1	0	0	0	7	3	6	2	7	11	0	11	53
05:00	4	0	0	0	0	0	0	4	6	5	8	10	0	6	43
06:00	5	8	2	0	0	1	0	11	19	35	8	6	2	13	110
07:00	38	21	3	0	0	1	2	20	53	29	44	11	2	48	272
08:00	67	10	2	0	0	1	32	136	108	67	44	14	5	88	574
09:00	85	20	2	2	2	29	9,3	138	108	46	11	11	4	106	657
10:00	64	28	2	1	0	3	25	106	126	53	28	8	2	78	524
11:00	84	15	2	0	0	4	27	109	111	52	26	13	0	66	509
12:00	104	25	2	0	0	13	39	84	88	46	26	8	1	56	492
13:00	93	30	1	0	6	1	32	79	97	44	21	9	2	57	472
DAY TOTAL	556	166	20	5.	9	55	264	707	769	416	261	123	21	565	3937
PERCENTS	14.1%	4.2%	0.5%	0.1%	0.2%	1.4%	6.7%	18.0%	19.5%	10.6%	6.6%	3.1%	0.5%	14.4%	100.0%

Statistical Information...

15th Percentile Speed 38.2 mph

Median Speed 46.2 mph

10 MPH Pace Speed 40 mph to 50 mph 769 vehicles in pace Representing 27.3% of the total vehicles

85th Percentile Speed 54.8 mph

Average Speed 45.1 mph

Vehicles > 65 MPH 21 0.7%